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ORDINANCE 2475

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ADDING SAFETY ELEMENT TO VISALIA AREA
GENERAL PLAN

FEB 03 1987

UNIVERSITY OF CALIFORNIA

BE IT ORDAINED BY THE COUNCIL OF THE CITY OF VISALIA that the City of Visalia does adopt the Tulare County Safety Element with the following recommendations substituting for all recommendations within the Tulare County Safety Element:

Economic Well Being and Prevention of Structural Damage

- (1) It is the policy of the City of Visalia to operate fire safety provisions of various current codes including building, mechanical, electrical, and uniform fire code, to reflect greater concern for fire safety.
- (2) It is the policy of the City of Visalia to continue an ongoing active program designed to eliminate unfit, unhealthy, dangerous, structurally unsafe, and fire hazardous housing units by rehabilitation or removal. The public, departments or agencies having knowledge of such units or the vacancy of such units should notify the appropriate or concerned agencies (Building, Fire, Health, and Police).
- (3) It is the policy of the City of Visalia to continue the use of an "inspection team" to inspect all deteriorated and dilapidated housing units in the City. This team carries out appropriate action such as giving instructions, red tagging, posting and removal of housing units when necessary. The team approach incorporates staff from departments having expertise in the area of inspection for safety, sanitation, and structural adequacy.
- (4) It is the policy of the City of Visalia to give those families, that must remove or leave dilapidated units, consideration in the allocation of housing units that are produced by publicly-assisted housing programs.
- (5) The policies regarding unsafe and unsanitary structures, as contained herein, shall apply equally as well to other structures that are used by the public, such as restaurants and theatres and those which are classified within this report as "critical facilities."
- (6) It is the policy of the City of Visalia, through the land use planning process and Building Department programs, to locate such structures as nursing homes, housing for the elderly, and other housing for the mentally and physically infirm within reasonable distance (3 miles or 3 minutes) from fire stations.

- (7) It is the policy of the City of Visalia to develop better standards for addressing buildings so as to assist emergency service personnel in locating structures in case of disaster.
- (8) It is the policy of the City of Visalia to make available fire alarm systems, as referred to in this Element, to be tied directly and automatically to the Visalia City Fire Chief's alarm-receiving center. This would apply to private companies that wish to have better protection, as well as public buildings and other structures where the Fire Chief and/or the building inspector deem it necessary to have such protection.

Education and Disaster Preparedness

- (1) It is the policy of the City of Visalia to encourage fire and law enforcement departments to periodically conduct joint training exercises with the goal of developing the best possible coordinated action in fire suppression and crowd control.
- (2) It is the policy of the City of Visalia to rely on the Tulare County Office of Emergency Services to maintain inventories of available resources to be used during disasters.
- (3) It is the policy of the City of Visalia to continue to upgrade preparedness strategies and techniques at all levels of government so as to be prepared when disaster, either natural or man-made, occurs.
- (4) It is the policy of the City of Visalia to encourage the Visalia City Fire Chief to continue to increase his efforts toward inducing the public to reduce risk.
- (5) It is the policy of the City of Visalia to work to reduce the possibilities of conflagration due to fire or a combination of fire, flood and seismic disasters, so that the objectives of the Insurance Services Office can be more adequately met and eventual reduction in the cost of insurance premiums may result.
- (6) The City of Visalia shall continue to coordinate a public education program in order to foster public awareness of fire hazards with the intention of reducing injury and loss of life, damage to property, and degradation of the natural environment, particularly in conjunction with the public school system and "critical facility" personnel.
- (7) It is the policy of the City of Visalia to carry out education programs through the public and private schools, the libraries, police and fire departments, the news media, civic organizations, and through various related City departments as the Planning and Building departments.

- (8) Education programs carried out by the City of Visalia shall seek to reach all age groups, socio-economic classes, and both urban and rural residents. Education programs should be offered in both Spanish and English, as appropriate.

Environment

- (1) The City of Visalia shall continue to enforce weed abatement in order to promote fire safety.
- (2) It is the policy of the City of Visalia to assist in solving the incendiary problem by improving present law enforcement and investigation equipment, adapting equipment available in other fields; and purchasing new equipment where needed. No-burn laws should be given greater emphasis, particularly in areas outside of immediate response zones of fire stations.
- (3) A priority of consumptive uses is hereby recommended by the Visalia City Council for various water sources to insure availability of adequate supplies to meet public health and safety needs, and for resource protection. Suggested priority:
 - (a) Potable water supply, fire protection, and domestic uses.
 - (b) Resource protection and preservation.
 - (c) Industrial, irrigation and commercial uses.
 - (d) Water-oriented or water-enhanced recreation.
 - (e) Air conditioning.
- (4) The City of Visalia shall maintain the recommendations contained in the County Flood Control Master Plan.

Management and Funding

- (1) It is the policy of the City of Visalia to encourage fire control agencies to continue to keep fire data in a form that combines the following:
 - (a) Number of fires by activity and area.
 - (b) Number of users in the activity.
 - (c) Number of fires by ignition index in State responsibility areas.
 - (d) Any other methods determined by the Safety Committee as necessary.

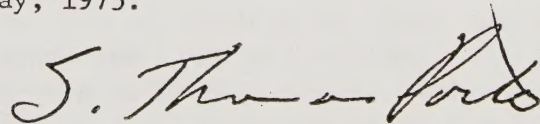
Damages and costs per fire should be computed and compiled by burn index and activity.

- (2) It is recommended that the City Fire Chief maintain statistical information in a form that can be geographically indexed for cost benefit analysis by the City Manager.
- (3) As part of the planning process, it is the policy of the City of Visalia that building permits be reviewed by the City Fire Chief for potential fire hazard. The City Fire Chief is requested to make recommendations regarding risk of hazard associated with the use of materials, type of structures, location of structures and subdivisions, road widths, location of fire hydrants, water supply, and other considerations regarding fire hazard that may be technically feasible but not included in present ordinances or policies.
- (4) It is the policy of the City of Visalia to continue to implement, through the subdivision and zoning procedure, the recommendations contained within flood plain management studies already completed by the County Planning Department as part of the ongoing safety requirements to be considered within the development process.
- (5) It is the policy of the City of Visalia to encourage the enlistment of the aid of courts, prosecuting attorneys, and the general public to make present laws more effective in dealing with the problems of illegal use of fire and fire-causing practices.
- (6) It is the policy of the City of Visalia to have a technically qualified communications officer to address the problem of communications within the City.
- (7) During major disasters, the primary coordinating official, on behalf of the City Council, shall be the City Manager.

Public Safety and Standards

- (1) It is the policy of the City of Visalia to adopt the latest version of Uniform Codes, including the Uniform Fire Code, current edition, as prepared by the Western Fire Chief's Association.
- (2) It is the policy of the City of Visalia to support adequate fire prevention teams within the City fire protection system in order to properly inspect potentially fire-hazardous structures within the jurisdiction of the City.

PASSED AND ADOPTED this 27th day of May, 1975.



S. THOMAS PORTER, MAYOR

ATTEST: DONNA HALL, CITY CLERK

I, Donna Hall, City Clerk of the City of Visalia, certify the foregoing is a full and true copy of Ordinance 2475 passed and adopted by the Council of the City of Visalia at a regular meeting thereof held on the 27th day of May, 1975, and certify said ordinance summary has been duly published.

Donna Hall

DATED May 28, 1975

DONNA HALL, CITY CLERK

1. The first part of the report is a summary of the work done during the year. It is a very brief summary, but it gives a good idea of the work done. It is written in a very simple and straightforward manner, and it is easy to read. It is a good example of a summary of work done.

2. The second part of the report is a detailed account of the work done. It is written in a very simple and straightforward manner, and it is easy to read. It is a good example of a detailed account of work done.

3. The third part of the report is a summary of the results of the work done. It is written in a very simple and straightforward manner, and it is easy to read. It is a good example of a summary of results of work done.

4. The fourth part of the report is a summary of the conclusions of the work done. It is written in a very simple and straightforward manner, and it is easy to read. It is a good example of a summary of conclusions of work done.

5. The fifth part of the report is a summary of the recommendations of the work done. It is written in a very simple and straightforward manner, and it is easy to read. It is a good example of a summary of recommendations of work done.

6. The sixth part of the report is a summary of the conclusions of the work done. It is written in a very simple and straightforward manner, and it is easy to read. It is a good example of a summary of conclusions of work done.

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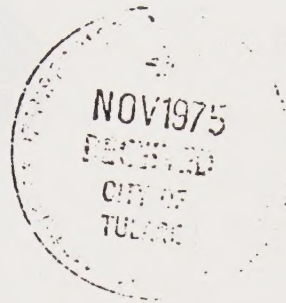
8. The eighth part of the report is a summary of the conclusions of the work done. It is written in a very simple and straightforward manner, and it is easy to read. It is a good example of a summary of conclusions of work done.

9. The ninth part of the report is a summary of the conclusions of the work done. It is written in a very simple and straightforward manner, and it is easy to read. It is a good example of a summary of conclusions of work done.

10. The tenth part of the report is a summary of the conclusions of the work done. It is written in a very simple and straightforward manner, and it is easy to read. It is a good example of a summary of conclusions of work done.

J. H. Smith
10/10/1910

TUCYPL-74-113



SAFETY ELEMENT

An element of the Tulare County General Plan

Approved: Tulare County Planning Commission
Resolution No. 4339, March 26, 1975

Adopted: Tulare County Board of Supervisors
Resolution No. 75-1104, June 17, 1975

Prepared by Tulare County Planning Department

County of Tulare



PLANNING DEPARTMENT

Telephone (209) 732-5511 - Ext. 341

Room 107, Courthouse

VISALIA, CALIFORNIA 93277

April 29, 1975

Tulare County Board of Supervisors
Courthouse
Visalia, CA 93277

Gentlemen:

The Safety Element of the Tulare County Area General Plan has been prepared in accordance with your requirements and in conjunction with agencies and individuals throughout the County who have expressed a desire to take part in the planning effort. We are most appreciative of the effort expended by the Office of Emergency Services, the Tulare County Fire Warden, the Tulare County Sheriff/Coroner, the California State Division of Forestry, and the City of Porterville Planning Department. The City of Porterville sat on the Technical Committee and provided the staff with a city perspective to the Element.

This Element will provide the cities in Tulare County with an adoptable Safety Element of their General Plan as required (Section 65302.1 of the Government Code), thus saving them considerable time and planning monies. Through the Tulare County Association of Governments, we have attempted to meet the needs of both the County and the cities in order to maintain consistency in the policy framework in which we must all operate.

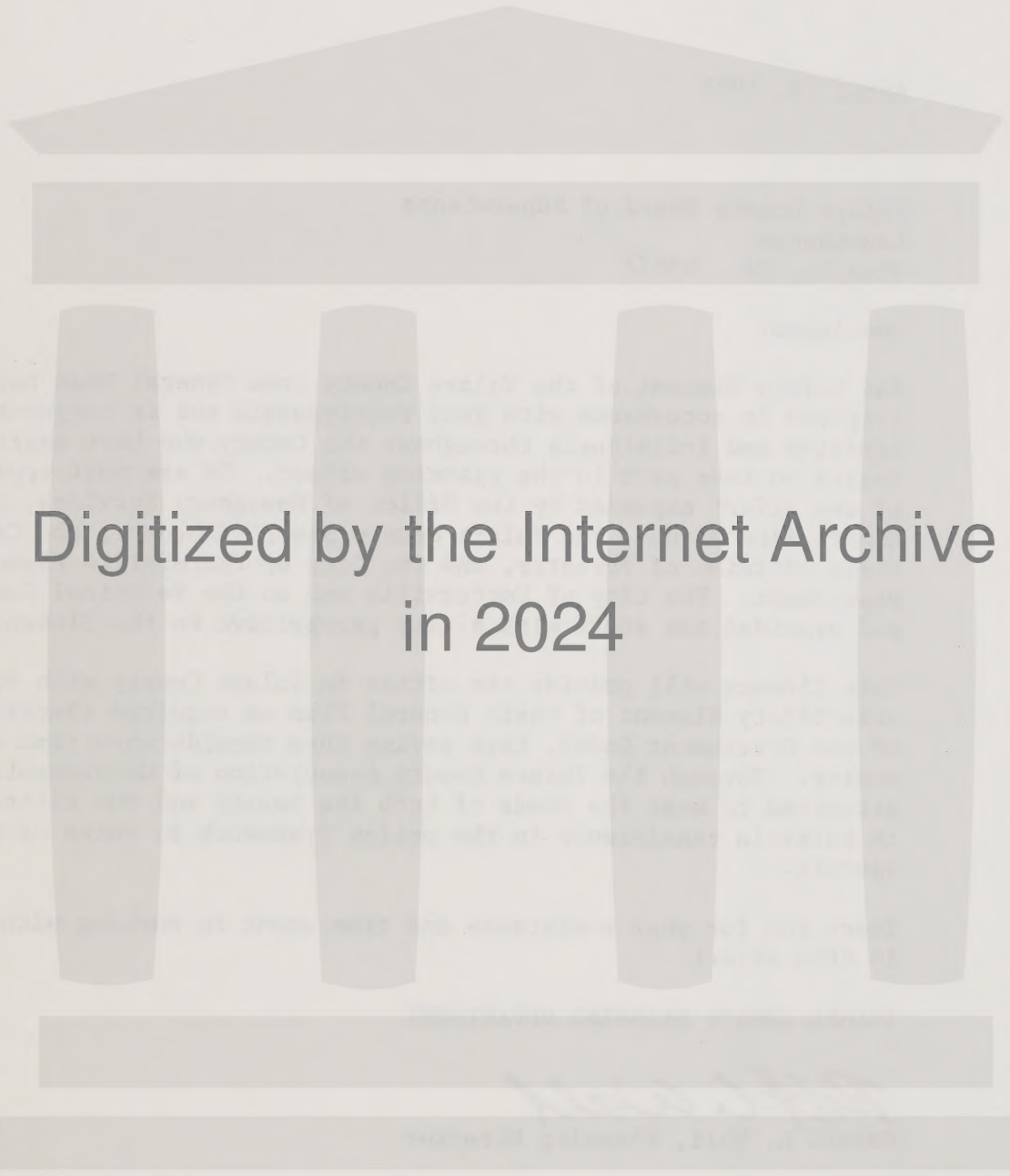
Thank you for your assistance and time spent in working with the staff in this effort.

TULARE COUNTY PLANNING DEPARTMENT

A handwritten signature in cursive script that reads "Robert L. Wall".

Robert L. Wall, Planning Director

RLW:KPL:mn



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BIBLIOGRAPHIC DATA SHEET		1. Report No.	2.	3. Recipient's Accession No.																																								
4. Title and Subtitle Safety Element of the Tulare County General Plan			5. Report Date September 1974	6.																																								
7. Author(s) Tulare County Planning Department			8. Performing Organization Rept. No. TUCYPL 34-113																																									
9. Performing Organization Name and Address Tulare County Planning Department Tulare County Association of Governments			10. Project/Task/Work Unit No.																																									
			11. Contract/Grant No. CPA 1032.19																																									
12. Sponsoring Organization Name and Address Courthouse Room 107 Visalia, California 93277			13. Type of Report & Period Covered Final																																									
			14.																																									
15. Supplementary Notes Prepared in cooperation with Tulare County Fire Warden, Tulare County Sheriff, Tulare County Office of Emergency Services, and cities within the County																																												
16. Abstracts Analysis of fire, seismic, flood and other hazards that specifically relate to the land use planning process in Tulare County. Other plans and programs as they relate to Safety are considered. Policy recommendations are made for reducing hazards and conserving economic, environmental and social values within the County.																																												
17. Key Words and Document Analysis. 17a. Descriptors																																												
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Primary: Earth Sciences, Seismology, Civil Engineering, Safety Engineering																																												
Secondary: Forestry, Structural Engineering, Reactor Engineering and Operations																																												
17c. COSATI Field/Group																																												
18. Availability Statement (limited quantity) Tulare County Planning Department Courthouse, Room 107 Visalia, California 93277		19. Security Class (This Report) UNCLASSIFIED	21. No. of Pages																																									
		20. Security Class (This Page) UNCLASSIFIED	22. Price \$14.00																																									

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with assistance from

ENVICOM CORP. - Sherman Oaks, CA
Joe Johns, President
Donald O. Asquith, Vice-President

This document was prepared with technical assistance from the Council on Intergovernmental Relations utilizing a Comprehensive Planning Assistance Grant from the U. S. Department of Housing and Urban Development under the provisions of Sec. 701 of the Housing Act of 1959 as amended. (CPA/1032.19)

Some of the staff worked specifically on this report; however, all of the staff contributed either directly or indirectly to the preparation of it.

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TABLE OF CONTENTS

SAFETY ELEMENT
OF TULARE COUNTY GENERAL PLAN

	<u>Page</u>
CHAPTER I	1
Introduction	
Summary of Policies & Recommendations	
CHAPTER II	11
Goals	
Methodology & Assumptions	
Recognition of Hazards	
CHAPTER III	15
Wildland Fire Hazards	
Fire Characteristics - Variables for Planning	
CHAPTER IV	27
Structural Fire Hazards	
Codes	
CHAPTER V	41
Fire Safety - People	
Fire Control Limitations and Possibilities	
Critical Facilities	
CHAPTER VI	49
Seismic Hazard	
Land Use Relationships	
CHAPTER VII	59
Jurisdictions of Fire & Police Protection Agencies in Tulare County	
Law Enforcement Service Area Characteristics	
Fire Protection Service Characteristics	
Alternatives for Increasing Effectiveness	
Eight Important Functions for Fire Departments	

LIST OF FIGURES

Causes of Unnatural Deaths 1970-1974	Preceding pg. 1
Fire Danger Rating Areas by Fire Load Index for Tulare County	18
Profiles of Tulare County with Fire Danger Rating Areas & Landscape Characteristics	Following pg. 20
Vegetative Fuel Loading Factors	Page 23
Slope Class & Fire Hazard Severity Scale	Page 24
Estimated Causes of Fires in Buildings in U.S.	Page 27
Structural Fires by Cause - Fire Causes	Page 29
Dollar Damage by Material Class (What Burned)	Page 32
Fire Insurance Savings as Related to Fire Protection	Page 35
State vs. Local Responsibility Area Responses	Page 37
Dollar Damage by Origin Class (Where the Fire Started)	Page 38
Listing of Fire Safety Facilities	Page 61
Law Enforcement Service Area Characteristics	Page 64
Fire Protection Service Characteristics	Following pg. 64
Alternatives for Increasing Effectiveness	Page 67
Eight Important Functions for Fire Departments	Page 67
A Guide for Protection from Flood Hazard	Page 70
Fire Safety Begins with Prevention	Appendix C

MAPS

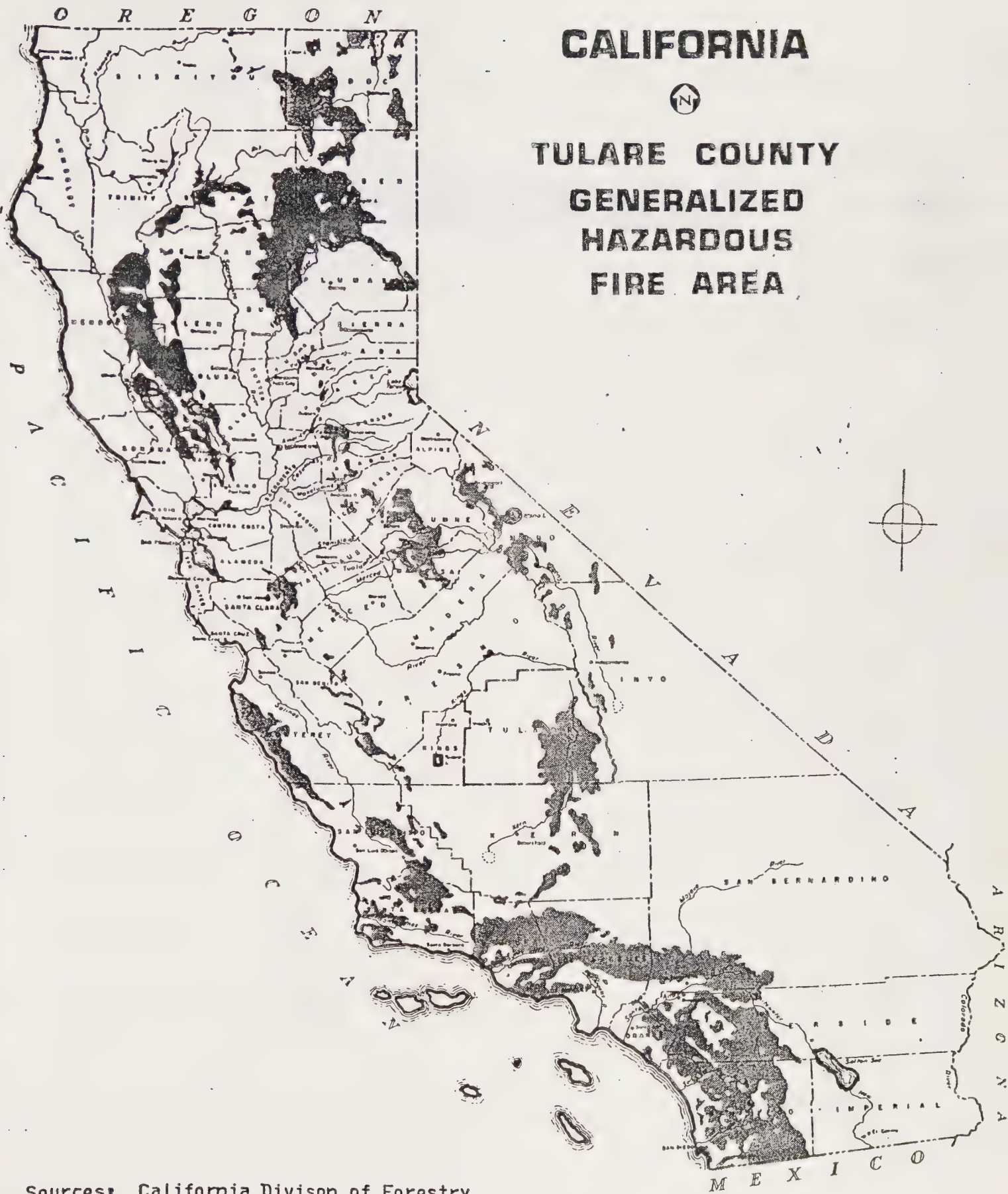
Generalized Hazardous Fire Area	Preceding pg. 1
Fire Danger Rating Areas and Fire Incidence Patterns	Following pg. 20
Major Industrial Facilities - Initial Attack Zones	Following pg. 38
Safety - Critical Facilities	Following pg. 48
Law Enforcement Service Areas	Following pg. 64
Fire Services Responsibility	Following pg. 64

APPENDIX

- A. State Guidelines for Preparation of a Safety Element
- B. Bibliography
- C. How To Prevent Fires In and Around the Home
- D. Safety Element EIR

PHOTOGRAPHY CREDITS

California Highway Patrol
Larry Nylund, Visalia Times-Delta
Terri Ohlwein, Tulare County Planning Department
Tulare Advance Register
Tulare County Fire Warden - California State Division of Forestry
Tulare County Public Works Department - Flood Control District
Valley Medical Clinic - Burn Center



CALIFORNIA
















TULARE COUNTY GENERALIZED HAZARDOUS FIRE AREA

Sources: California Division of Forestry

CAUSES OF UNNATURAL DEATHS 1970-1974

TULARE COUNTY

<u>CAUSE</u>	<u>NUMBER OF DEATHS</u>	<u>PERCENT</u>
TRAFFIC	 440	44.7%
SUICIDE	 101	10.3
DROWNING	 91	9.2
FALLS	 76	7.7
HOMICIDE	 65	6.6
ASPIRATION	 48	4.9
DRUG OVERDOSE	 40	4.1
ASPHYXIA	 37	3.8
PLANE CRASH	 16	1.6
INDUSTRIAL	 14	1.4
FIRE-BURNS	 14	1.4
GUNSHOT	 9	0.9
OTHER ACCIDENT	 33	3.4

Source: Tulare County Sheriff-Coroner

PREPARED BY TULARE COUNTY PLANNING DEPARTMENT

CHAPTER I

Introduction

In general, it can be said that Tulare County is a relatively safe place to live. There are areas that were uncovered during the preparation of the Safety Element that would indicate a greater need for study, such as evacuation routes in mountain communities where no evacuation plans have been prepared with fire safety being paramount as a consideration. The Safety Element has been prepared with fire hazards and fire safety being the primary consideration. Those people living in outlying areas of the County, and that are not within immediate service distance of fire stations can reduce fire hazard problems through the use of suppression devices. Such devices would be installed in homes, factories, and other areas where sufficient water or chemical control of fires is possible. The hazards associated with vehicles passing through the County or within the County are also a major consideration of the Tulare County Fire Warden. Certain types of crime are in general as great if not greater than in other parts of the State. New means of communication and coordination among emergency service personnel are underway and it is evident that the County will continue to maintain levels of safety as great, if not greater, than at present.

It is estimated by the County Fire Warden that within the last 10 years, 50 lives have been lost, 250 people have been injured and \$12,556,570 worth of property has been destroyed or damaged. These figures are misleading, since the number of lives lost or saved may not show up in the County Fire Warden's records.*

Hazards to the environment are generally considered to be significant within the mountain areas of Tulare County as compared to statewide surveys undertaken by the California Division of Forestry. Tulare County is shown to have a high potential for fire danger. In addition, the increasing numbers of agricultural industries being located in scattered areas throughout the County would indicate that there is a need for greater consideration for fire safety measures where adequate access to fire services do not presently exist. It is through the land use planning process that many of these problems can be addressed and the Safety Element is framed with this in mind.

*Figures for County area only

It was found that within the mountain areas, along stream bottoms and adjacent to roadways and in urban fringe areas, the fire hazard was greatest. Controlled burning may be necessary in some areas and removal of vegetation that is high in fuel loading potential should be removed.

Hazards due to geologic conditions, soil conditions, flooding and seismic potential are cited within the report. In some areas of Tulare County landslide potential is great and flood hazard is a major consideration in the land use planning process.

The County has invested considerable funds in the development of road networks, public works, public buildings, parks and other improvements. The private sector of the economy has invested heavily in the agricultural capability of the land itself. All of these investments are considered as value systems that are held to be important in the provision of disaster and fire services. Several cross sections were drawn through the County to indicate areas of high value that are of concern to residents in the County as well as people throughout the state and nation. It is these values that the Safety Element addresses.

Policies and recommendations are summarized in this chapter for easy reference. *It should be noted however that the extraction of these policies from the Element itself generally detracts from the impact of the policies themselves. The policies should be reviewed in light of the text itself.*

How To Use This Document

Only local general purpose governments and the Tulare County Association of Governments have the power and authority to adopt the Safety Element. The following procedure is recommended for adoption of the Element.

1. Analyze the impact of the study in relationship to the jurisdiction.
2. Evaluate policies, standards and programs suggested in the Element and select those which are most suited to the local jurisdiction.

3. The seismic safety risk zones as indicated in the text and on maps are referred to in the Seismic Safety Element of the General Plan and the jurisdiction should select the level of risk deemed to be appropriate by the local policy body.

The risk of fire hazard, flood hazard, crime and the nuclear hazard cannot be ascertained in the same manner that seismic hazard can be. Other kinds of risks are related specifically to zones indicated for fire hazard in the mountain and foothill regions. Standards for construction and reduction of risk attendant with man-made works are found throughout the text. The selection of tools, programs and devices to reduce risk in any given area is a policy decision that only a local general purpose government must, in the final analysis, make. The technical considerations found in this report will assist in making those decisions but they are in no way a substitute for the decision making process.

4. Review the problem statement, including the hazards associated with the area of the jurisdiction.

5. Modifications may be made to the text and policies as necessary. These should be reflected in the environmental impact finding that is presented to the jurisdiction upon adoption of the Element.

The Tulare County Planning Department, on behalf of the Tulare County Association of Governments, has circulated an environmental impact report for the Safety Element of the Area General Plan. The findings of this environmental impact report will be available upon request to any governing body that wishes to have them.

6. Add any other recommendations or modifications as necessary to meet the peculiar needs of the jurisdiction.

7. If modification is made to the Element, determine whether an environmental impact report or negative declaration will suffice. State Guidelines suggests that an environmental impact report be submitted to appropriate agencies.

8. Process plan through normal procedures. Public hearings before citizen review committees and Planning Commissions are required.

9. The Element may be adopted by resolution referring to or modifying the Safety Element of the Area General Plan for Tulare County. A typical resolution for this purpose can be found in the Seismic Safety Element previously prepared for all jurisdictions.

10. A copy of the resolution adopting the Element should be sent to the Tulare County Association of Governments so that reporting can be done on behalf of the counties and cities. This requirement must be met in order to comply with State Council on Intergovernmental Relations.

11. The California State Office of Planning and Research, located at 1400 10th Street, in Sacramento, should be notified of the adoption of the Element. A copy of the resolution should be sent to that agency.

Approach Used

The Safety Element has been prepared in conjunction with County and city agencies as well as state and federal agencies where it has been found necessary to obtain information and coordinate efforts in order to fulfill the requirements of the state planning law. The Agricultural Advisory Committee as well as the Environmental Quality Committee assisted the staff in preparing the goals and objectives for the Element. Early in the planning process it was deemed necessary to approach the problem of fire safety in more detail than other aspects of safety, primarily because of the complexity of the problem and the need for study in this area. The County has undertaken significant studies in the past few years related to environmental management, open space, floodplain management, soil conservation and seismic safety as well as housing. All of these elements have been used as a basis for preparing the Safety Element since these documents have been reviewed and approved by the Planning Commission or the Tulare County Association of Governments. In addition, the Water and Liquid Waste Management Element of Tulare County provides a basis for understanding the requirements of the local unincorporated communities throughout the County. The Water & Liquid Waste Management Element of the Tulare County General Plan program provides an essential basis for planning in these smaller communities.

Much has been written in recent years regarding fire hazards in California. What remains to be done, and what this Element attempts to do, is to incorporate the research that the State of California has completed; the work that has been completed by the County to date; the work completed by federal government agencies on fire hazard and abatement and the President's Commission on Fire Prevention and Control; into county scale. The wealth of information which is contained in the report called "America Burning" ⁴³ is supported by extensive research and analysis. No one having read this report can possibly come to the conclusion that we have solved all the problems related to fire safety. Tulare County is an agricultural county having a large tax base in terms of natural resources and its problems are unique.

Early in the process, goals were established for the plan. They are primarily to (1) attack the problem of how to conserve human life itself; (2) attack the problem of how to conserve the resources of Tulare County both man-made and natural; and (3) protect the tax base and man-made improvements that are necessary to the functioning of an agricultural economy that feeds a good portion of the world's population.

Requirements of the State Planning Law

The State of California under Government Code Section 65302.1 requires a Safety Element of all city and county General Plans as follows:

"A Safety Element for the protection of the community from fire, geologic hazards including features necessary for such protection as evacuation routes, peak load water supply requirements, minimum road widths, clearance around structures, and geologic hazard mapping in areas with known geologic hazard."⁷

This Element meets all the requirements of the State Planning law. In some cases, the specific design requirements for minimum clearance around structures in agricultural areas as opposed to natural areas is not clear within the context of state laws. The Element attempts to clarify some of these features within the law; however, judgment must often be used to interpret and apply laws and policies in force. It is questionable, from a technical point of view, as to whether many of these requirements are

either necessary or adequate in today's complex environment.

The scope and the nature of a Safety Element is contained in the Guidelines and includes the recommendation that safety hazards be recognized, goals be identified for reducing hazards, levels of acceptable risks be specified, and objectives to be attained in reducing safety hazards as related to existing and new structures be included as well as abatement of safety hazards in terms of priority.

The Element recognizes the diversity of safety hazards in the environment and set the priorities for reducing hazards specifically under the categories of seismicity, fire hazards, flood hazards, and to some extent, crime and other hazards.

Maps showing the location and extent of geologic hazards, fire susceptibility, critical facilities such as hospitals, schools, and major industries are included to show the extent of potential risk that is incurred by exposure to hazards.

The scope and nature of the Safety Element may include consideration for planning "defensible space" or reduction of crime through planning and design.⁷

Purpose

The purpose of this Element is to:

1. Fulfill the requirements of the State Planning law.
2. Meet safety needs of the Tulare County region.
3. Assist in the allocation of scarce resources.
4. Establish general goals, plans, programs and policies.
5. Set priorities for action where possible.

The last purpose is primarily one of coordination with the Office of Emergency Services which in the final analysis maintains liaison with the various safety agencies throughout the county.⁵³

General Conclusions

It is generally concluded that there is a need for coordination of the Elements to a better degree than what can possibly be accomplished within the context of just the Safety Element. The County Planning Department will, in the near future, attempt to amalgamate the various policies contained in the Elements that have been prepared and put them into a framework that can be better understood and therefore more frequently used and referred to by the community as a whole. This was found to be a need that has not yet been fulfilled. There are numerous policies contained within the Housing, Open Space, Floodplain Management, Soils, Economic, Land Use & Circulation Elements that should be reviewed within one to two years after completion of the Safety and Seismic Safety Elements. The very high and real costs of providing for safety cannot be overlooked. The Board of Supervisors needs to allocate resources for safety from some reasonable basis. The Element provides support for making decisions and the allocations of resources and providing of safety for the citizenry of Tulare County.

One aspect of the study that is not covered and which was brought up late in the planning process was the very real need for study of evacuation routes as they relate to fire and hazardous conditions in mountain areas. The evacuation routes, presently constituted, were formulated for the purpose of moving people from the valley floor in times of disaster, rather than from the mountain areas. It should be recognized that disasters can occur in the more mountainous areas of the County and it is in these areas that future effort in planning should be undertaken in order to develop emergency procedures.

Study Limitations

The project scale overlooks many of the more important considerations that would take place on a day to day basis in the decision making process in local government. This was necessary due to the large size of the County and the necessity for obtaining a broad over-view of the problem prior to detailing ordinances and other specific implementation devices. Some programs and objectives may have been overlooked in the preparation of the Element.

In addition it should be understood that levels of risk as defined in the CIR

Guidelines are separated into three distinct categories which appear to be reasonable in terms of understanding the appropriate risks that a community should consider taking. With maximum citizen input, as appropriate for each city and the county, an evaluation of risk and potential hazard and the planning response necessary thereto can be made. There is always a judgment involved in this kind of analysis and the risk that is acceptable to the community may not be to another. There is no such thing as a hazard-free environment. However, efforts can be productively undertaken to mitigate the consequences of known hazard when they have been identified.

The CIR Guidelines separate risk into these three distinct categories⁷ (also identified in the Seismic Safety Element of the Tulare County General Plan).

ACCEPTABLE RISK - the level of risk below which no specific action by government is deemed to be necessary.

UNACCEPTABLE RISK - the level of risk above which specific action by government is deemed to be necessary to protect life and property.

AVOIDABLE RISK - risk not necessary to take because individual or public goals can be achieved at the same, or less, total "costs" by other means without taking the risk.

It is evident from the definitions of risk that judgment on the part of policy makers and citizens is required to productively carry out the requirements of the Safety Element. Benefit/cost ratio analysis may be helpful in understanding abatement costs and consequently reducing it. Acknowledging the untangibles involved and comparing them with that of other projects can also be useful in better understanding the cost of risk and safety.

Due Date for Adoption of the Safety Element

The Safety Element is required to be adopted by all cities and counties as part of their general plan. Tulare County is required to adopt the Safety Element by March 20, 1975. The original due date of September 20, 1974, was extended six months by the Council on Intergovernmental Relations. Cities throughout the County have different due dates and they should make certain that adoption can be carried out by those dates.

Assistance by the Tulare County Association of Governments or the Tulare County Planning Department will be given upon request to cities wishing assistance in the adoption process.

Five County Seismic Safety Element

Those policies adopted by the Board of Supervisors and that are part of the Five County Seismic Safety Element prepared in conjunction with Fresno, Kings, Madera and Mariposa Counties are intended to become part of the Safety Element. State Guidelines allow for preparing both the Safety and Seismic Safety Elements as one document, however the County of Tulare has prepared these two documents separately. Upon review and adoption of the Five County Policy portion of the Seismic Safety Element relating to Tulare County, it is intended that those policies be integrated with the Safety Element.

Traffic Safety

The General Plan guidelines delineated by the California Council on Intergovernmental Relations (Sept. 1973) for the Safety Element, do not require any discussion pertaining to traffic safety. As an informational item for the reader, the topic of traffic safety will be discussed briefly.

The accumulation of traffic accident statistics is performed by the Tulare County Public Works Department on County roads and the California Department of Transportation for State highways. Statistics and road data are exchanged between these two agencies and the California Highway Patrol for a more efficient traffic safety program. This process also takes place within the various cities in the County; however, this exchange of traffic safety data is between the public works and police departments.

This data can be integrated into many of the planning processes which involve a change of land use or activities along County or City thoroughfares.

Summary of Policies

The Board of Supervisors of the County of Tulare after due consideration, have adopted the following policies as part of the Safety Element of the Tulare County Area General Plan. These policies as shown below, are official policies of Tulare County and no other policies within the context of this document are to be construed as official. Other policies that were redrafted or modified in the study sessions that preceded adoption of this Element

remain in the body of the text and anyone wishing to review those policies as originally stated should do so with the full understanding that these are part of the technical report recommendations rather than part of the adopted policy.

Economic Well Being and Prevention of Structural Damage

1. It is a policy of the County of Tulare to maintain an on-going active program designed to eliminate unfit, unhealthy, dangerous, structurally unsafe and fire hazardous housing units which are in such condition as to be reasonably beyond repair or rehabilitation. All departments or agencies having knowledge of such units or the vacancy of such units should notify the appropriate or concerned agencies (Building, Fire, Health and Sheriff).
2. It is the policy of the County of Tulare Building Department to continue the program to have unsafe structures repaired or removed.
3. The County of Tulare recommends that each incorporated city within the County follow a similar program as outlined in this Safety Element and further recommends that the Safety Element be adopted by incorporated cities with modifications as necessary for their general plan program. The incorporated cities are encouraged to coordinate their adoption procedures and record keeping with the County.
4. The County of Tulare shall utilize the services of the County Counsel's Office to investigate methods of shortening procedures before a housing unit can be condemned and demolished.
5. It is the policy of the County of Tulare to give those families that are asked to remove dilapidated units or to leave such units, consideration in the allocation of housing units that are produced by publicly assisted housing programs.
6. It is the policy of the County of Tulare to encourage and assist families living in unsafe structures to find safer living units. It is policy to give priority, when possible, to locate those families in public housing programs.
x Ref. Funding
7. The policies regarding unsafe and unsanitary structures as contained herein shall apply even more importantly to structures that are used by the public, such as restaurants and theaters and what is termed in this report "Critical Facilities."

8. It is the policy of the County of Tulare, through the land use planning process and Building Department programs, to locate such structures as nursing homes, housing for the elderly, and other housing for the mentally and physically infirm within reasonable distance from fire stations.

x Ref. Management

9. It is the policy of the County of Tulare to develop better standards for numbering buildings on private driveways so as to assist emergency service personnel in locating structures in case of disaster.

10. It is the policy of the County of Tulare to encourage further study and analysis of public expenditures vs. private expenditures of funds for on-site safety with the objective of the user/benefit concept in mind.

11. It is the policy of the County of Tulare to encourage installation of a system of heat and/or smoke detection devices and encourage a sprinkler system and other fire suppression equipment including fire hoses and water storage tanks or fire hydrants for structures that exceed 7500 square feet in floor area for the following facilities:

Critical facilities (public buildings).

Permanent industrial facilities employing ten or more people on a year-round basis.

Housing for the elderly, children and mentally infirm.

Nursing homes and hospitals.

Structures where large amounts of chemicals or fuels are known to be stored and are considered to be significantly dangerous by the Fire Warden.

As required by the Fire Warden or other legislation.

12. It is the policy of the County of Tulare to encourage a system of heat and/or smoke detection devices for the following facilities:

Existing homes.

New homes to be constructed.

Structures with high value storage capacity.

Mobilehomes.

Existing offices and other buildings.

13. It is the policy of the County of Tulare to encourage fire alarm systems as referred to in this Element, to be tied directly and automatically to the Tulare County Fire Warden's alarm receiving center. This would apply to private companies that wish to have better protection as well as public buildings and other structures where the Fire Warden and/or the Building Inspector deem it necessary to have such protection.

Education and Disaster Preparedness

1. It is the policy of the County of Tulare to encourage fire and law enforcement departments to periodically conduct joint training exercises with the goal of developing the best possible coordinated action in fire suppression and crowd control.

2. The Tulare County Office of Emergency Services shall maintain inventories of available resources to be used during disasters.

3. It is the policy of the County of Tulare to continue to upgrade preparedness strategies and techniques at all levels of government so as to be prepared when disaster, either natural or man-made occurs.

4. It is the policy of the County of Tulare to encourage the Tulare County Fire Warden to continue to increase his efforts toward inducing the public to reduce risk.

5. It is the policy of the County of Tulare to work to reduce the possibilities of conflagration due to fire or a combination of fire, flood and seismic disasters, so that the objectives of the Insurance Services Office can be more adequately met and eventual reduction in the cost of insurance premiums may result.

6. The County of Tulare shall continue to coordinate a public education program in order to foster public awareness of fire hazards with the intention of reducing injury and loss of life, damage to property and degradation of the natural environment, particularly in conjunction with the public school system and "critical facility" personnel.

7. It is the policy of the County of Tulare to carry out education programs through the public and private schools, the libraries, police and fire departments, the news media, civic organizations, and through various related County departments such as the Planning Department and Building Department.

8. Education Programs carried out by the County of Tulare shall seek to reach all age groups, socio-economic classes, and both urban and rural residents. Education programs should be offered in both Spanish and English languages as appropriate.

9. It is the policy of the County of Tulare to instruct the public with respect to the necessity for a county-wide fuel-management program including dissemination of information on no-burn areas within the County.

Environment

1. The County, in concert with the California Division of Forestry, National Park Service, National Forest Service, and Bureau of Land Management shall encourage and promote the maintenance and/or widening of existing fuel breaks or controlled burning practices in order to bring about more effective fire suppression.

2. The County of Tulare recommends that construction of new fuel breaks be justified on a least cost-plus loss basis and within comprehensive watershed management plans.

3. It shall be the policy of the County of Tulare to establish standards for locating and constructing fuel breaks and greenbelts in concurrence with the County Planning and Building Departments and federal agencies.

x Ref. Structural

4. The County of Tulare shall continue to encourage weed abatement programs by existing fire service districts in rural service centers and urban areas in order to promote fire safety; utilizing tax levies or other owner imposed costing devices to reimburse districts.

x Ref. Structural

5. It is the policy of the County of Tulare to assist in solving the incendiary problem by improving present law enforcement and investigation equipment; adapting equipment available in other fields; and purchasing new equipment where needed. No-burn laws should be given greater emphasis particularly in areas outside of immediate response zones of fire stations.

6. A priority of consumptive uses is hereby recommended by the Tulare County Board of Supervisors for various water sources to insure availability of adequate supplies to meet public health and safety needs, and for resource protection. Suggested priority:

- A. Potable water supply, fire protection, and domestic and agricultural uses.
- B. Resource protection and preservation.
- C. Industrial and commercial uses.
- D. Water-oriented or water-enhanced recreation.
- E. Air conditioning.

Priorities will vary by management zones.

x Ref. Economic

7. The County of Tulare intends to carry out the recommendations contained in the County Flood Control Master Plan.

x Ref. Economic

8. It is the policy of Tulare County to undertake, within Urban Boundaries, and particularly within Urban Improvement Areas, where storm and flood prevention improvements have not been installed, a vigorous program to install such facilities in accordance with a master drainage control plan for the area concerned. Priorities should be conditioned upon locations where flood and sheet flow hazard is greatest.

9. It shall be the policy of Tulare County to instigate a Safety Committee, composed of members of various county departments and agencies with responsibility and authority in such matters. The Committee should perform various functions including, but not restricted to: Coordination of such agencies for efficiency in protection of public safety; uniform administration of safety requirements throughout the County; designation of sheet flow hazard and flood prevention areas of the County where Urban Improvement Facilities for storm drainage are necessary; adopting provisions which attempt to prevent safety requirements from becoming excessive economic burdens for the County. Suggested representation on this Committee include: California Division of Forestry; Public Works; California Highway Patrol; County Executive; Emergency Services Officer; Planning Department; Agricultural Commissioner; National Forest Service; National Parks Service; Bureau of Land Management; County Sheriff; and cities.

Management and Funding

1. It is the policy of the County of Tulare to encourage fire control agencies to keep fire data in a form that combines the following:

- A. Number of fires by activity and area.
- B. Number of users in the activity.
- C. Number of fires by ignition index in State responsibility areas.
- D. Any other methods determined by Safety Committee as necessary.

Damages and costs per fire should be computed and compiled by burn index and activity.

x Ref. Management

2. It is recommended that the County Fire Warden maintain statistical information in a form that can be geographically indexed for cost-benefit analysis by the County Executive.

x Ref. Economic

3. As part of the planning process, it is the policy of the County of Tulare that building permits being considered for a site having potential fire hazard be reviewed by the County Fire Warden. The Fire Warden may be requested to make recommendations to property owners regarding risk of hazard associated with the use of materials, types of structures, location of structures and subdivisions, road widths, location of fire hydrants, water supply and other important considerations regarding fire hazard that may be technically feasible but not included in present ordinances or policies.

4. It is the policy of the County of Tulare to continue to implement through the subdivision and zoning procedure, the recommendations contained within flood plain management studies already completed by the County Planning Department as part of the on-going safety requirements to be considered within the development process.

x Ref. Economic

5. It is the policy of the County of Tulare, in conjunction with the Tulare County Association of Governments, to provide technical assistance to cities in preparing the Safety Element of their General Plans, if requested by those cities to do so.

6. It is the policy of the County of Tulare to encourage the enlistment of the aid of courts, prosecuting attorneys, and the general public to make present laws more effective in dealing with the problems of illegal use of fire and fire causing practices.

7. It is the policy of the County of Tulare to have a technically qualified communications officer to address the problem of communications within the County.

8. During major disasters, the primary coordinating official on behalf of the Board of Supervisors shall be the director of the Office of Emergency Services.

Public Safety and Standards

1. It is the policy of the County of Tulare to assure that public hearings are held at convenient times and places prior to construction of nuclear facilities in order to assess possible hazards to the County of Tulare.

2. It is the policy of the County of Tulare to support the following standards for use and development of areas of varying fire hazard and the County Planning Department is hereby instructed to apply the Fire Hazard Severity Scale as indicated below to proposed developments or uses within wildlands. The

following minimum requirements should be met in relation to the three classes of Fire Hazard Severity as discussed within the context of the Safety Element.

x Ref. Environment

Extreme Hazard - extreme caution should be used in allowing development, particularly in critical facilities.

x Ref. Environment

Moderate Hazard - strict compliance with existing state statutes and local ordinances should provide adequate fire protection.

Minimum Hazard - development should be allowed, with recommendations for mitigation of hazard by Fire Warden.

x Ref. Environment

Special conditions, even in areas of "Moderate Hazard," may exist which may demand special and specified requirements under which development or use of the area should occur.

3. The 30 foot brush clearance zone around homes should be extended to greater distances where homes are situated on or near slopes. A formula should be adopted which relates percent of slope to width of brush clearance required and the formula should be included within the County Zoning Ordinance.

x Ref. Environment

4. The map titled Fire Danger Rating Areas and Fire Incidence Patterns included in Chapter III of this document is intended to be a general guide for land use recommendations to be brought before the Board of Supervisors when development is proposed in mountain and foothill regions of the County. Zone 410, indicated on the Fire Danger Rating Area Map, shall be related to vegetation and topographic conditions when recommendations are made to the Board of Supervisors in this zone. The Board of Supervisors recognizes that this zone is of value for residential uses if agricultural lands are to be conserved. (Fire hazard in Zone 410 is primarily due to wind and climatic factors).

5. Environmental Impact Reports should be required on all projects in areas of extreme hazard as defined herein (a project is defined within the California Environmental Quality act).

6. It is the policy of the County of Tulare to encourage the development of building construction codes that are uniform for all wildland areas but that can be designed to fit specific wildland conditions.

x Ref. Environment

7. It is the policy of the County of Tulare to recognize that widths of fuel clearance roadways, as well as around buildings, are a function of fuel height, slope, and topographic "shape of the land." Subdivision and land division procedures should include close coordination with the County Fire Warden.

x Ref. Environment

8. It is the policy of the County of Tulare to require that water supply systems be related to the size and configuration of land developments. Standards as set forth in the current subdivision ordinance shall be maintained and improved as necessary

x Ref. Management

9. It is the policy of the County of Tulare to require that proposed developments or uses in wildland areas be subject to review by local fire agencies responsible for protecting development after they are constructed. After a thorough study of the possible hazards and risks that would be associated with completion and the use of the development, the local fire agencies should require that fire prevention and possible suppression standards be met.

x Ref. Environment

10. Development proposals passed by the Board of Supervisors or Planning Commission shall require fire standards be taken into consideration and met, particularly in regard to critical facilities.

x Ref. Economic

11. It is the policy of the County of Tulare to enforce Chapter 70 of the Uniform Building Code as it relates to grading.

12. Five minutes or five miles shall be the County's goal for fire services to inhabited rural County areas.

13. It is the policy of the County of Tulare through the Building and Health Departments, to enforce policies and objectives of the 1974 Housing and Community Development Act in order to insure safe and decent housing for low and moderate income families.

x Ref. Economic

14. It is the policy of the County of Tulare to urge strengthening fire safety provisions of various codes including building, mechanical, electrical, and uniform fire code, to reflect greater concern for fire safety.

Plan Update Policies

1. The County of Tulare intends to expand more fully upon the State guidelines for a Safety Element which at present are not adequate to meet the needs of Tulare County.

2. The Safety Element shall be amended in the near future to include policies and supported data on other safety risks of particular concern to Tulare County that were not included within this document. The Planning Department in conjunction with law enforcement and other agencies shall prepare Part II of the Safety Element to include concern and recognition for hazards related to mountain areas, water safety, ambulance dispatch, public protection in remote recreational areas and definition of roles of the various Public Safety Agencies in an overall safety program. All causes of unnatural deaths shall be considered upon preparation of Part II of the Element and additions thereto.

3. Of particular significance is natural death occurrences in recent years in Tulare County particularly coronary disease and related symptoms. The Planning Department shall review ambulance franchising and dispatching operations and possibilities for utilization of adjacent County Emergency Services in order to upgrade any service deficiencies that may be causing higher death rates indirectly.

4. The Safety Committee, as proposed within this Element shall review the adequacy of joint agreements between safety and fire agencies where those agreements cross jurisdictional boundaries and County/City boundaries, with intent of providing the Board of Supervisors with more up-to-date information on the adequacy of these agreements and modifications and recommendations that are appropriate regarding these agreements.

5. Expansion of the Safety Element (Part II) shall also include adequate definitions of land use and its relationship to crime.

6. Tulare County shall provide for adequate search and rescue operational capability to the Tulare County Sheriff's Department in mountainous areas. Of particular concern to the Tulare County Board of Supervisors are those areas on the eastern side of the Sierra Nevadas that cannot be adequately reached by highway access on all weather roads.



Alley ways can become hazardous from not only a fire safety standpoint but from the standpoint of crime prevention and health maintenance. Weed abatement problems and trash collection can be seen in this photograph.

Although alleys are not normally required in modern subdivisions there are still many areas of the County where existing alley ways and vacant lots are in need of clean-up.

CHAPTER II

II-A SAFETY ELEMENT GOALS

1. To reduce the loss of life due to crime, fire, earthquakes, flooding and other disasters, natural and man-made.

2. To reduce the damage or loss of personal property due to crime, fire, earthquakes, flooding and other disasters, natural and man-made.

3. To protect and enhance the natural environment by reducing the level of hazard from natural and man-made causes, such as fires, flooding and criminal or negligent activity.

4. To work, primarily through local law enforcement agencies, and in conjunction with the Federal and State governments acting through the California Criminal Justice Program to reduce the level of criminal activity and lower the risks to life and property associated with such activity.

5. To hold public hearings before the Board of Supervisors in all cases regarding the production, storage, utilization or transporting of nuclear material either within the County, or in adjacent counties which may be of concern to Tulare County residents, so as to inform the public of the potential risk of nuclear materials and their use, and to elicit a response from them.

6. To disseminate information regarding these facilities having significant public safety hazards through the Emergency Services Office of the County.

7. To reduce the hazards associated with the storage, transporting, and use of chemicals such as fuel and pesticides.

8. To encourage and support the development of a County Disaster Plan, and to disseminate information about the plan to residents of the County.

9. To protect the health, safety and welfare of residents and to work with them in resolving problems of health and safety.

10. To work in conjunction with the special districts towards the resolution of intergovernmental problems associated with disaster prevention and response.

11. To work in conjunction with the special districts, the State of California

or Tulare County Fire Warden to provide an adequate amount of essential manpower, equipment and facilities and budget in order to meet the safety needs of the County, cities under contract with the County and State, and obligations to neighboring counties and cities, the USDA National Forest Service, National Park Service, and the Federal Bureau of Land Management.

12. To preserve and protect the national, State and local unique places of interest and beauty that are within the jurisdiction of the County of Tulare.

13. To protect the agricultural resources that are necessarily of great value to people, not only in Tulare County, but throughout the nation and the world.

II-B METHODOLOGY

This Safety Element first identifies and examines the various factors which create potential fire, seismic, flood and crime hazards to life and property and to the environment. Some factors are beyond man's control; others can be lessened or eliminated. Some hazards can be decreased by government action, while others must be volunteered by private citizens.

This element concentrates on fire hazards. Although there is mention of seismic hazards, reference is made to the Seismic Safety Element³² for more thorough discussion of seismic hazards.

To a limited extent this Element will consider hazards from the transporting, storage, installation and use of nuclear materials; hazards from possible or probable floods; hazards from the transporting, storage, and use of fuels and other dangerous chemicals; and from crime.

The basic methodology used involves identifying, mapping and evaluating existing and potential hazards, both as to severity and frequency of occurrence. Where data was available with which to formulate policies and recommendations, the task of preparing this Safety Element was made easier. Where specific aspects of the Safety Element had already been studied, then the Element references that previous work. The major new effort has been to examine fire hazard and the need for policies and recommendations in this regard.

The need for maintaining a first class emergency response mechanism, capable of meeting a variety of demands in an increasingly complex industrial/agri-business community necessitates emphasis in a comprehensive fire and rescue service. Protection of the high assessed valuation and providing economic base to the community at large is of major concern. Our complex environment, unable to withstand all of the demands being placed upon it without careful resource management, is not only hazardous, but economically and environmentally unstable.

Inherent within this methodology is the recognition of the intricate relationship between natural resources, water, agriculture and economic and social stability. Without adequate and competent fire, police and emergency service capabilities at the local level of government, land use functions would constantly be in jeopardy.

The methodology for preparation of the Safety Element carries underlying assumptions that are stated prior to describing the methodology itself.

1. The level of risk presently being incurred by the residents of the County can be reduced.
2. There is a need for safety factors to be recognized in the land use planning process.
3. Safety is a primary consideration of the Board of Supervisors and City Councils.

Some aspects of safety are more directly affected by other levels of government, however, the land use planning function is a primary responsibility of local government.

Hazards are pointed out irrespective of jurisdictional boundaries in many cases due to the overlapping responsibilities of the levels of government. For example, jurisdiction does not just lie in physical areas but also with respect to establishing standards of design, materials, flammability, etc. The California Division of Forestry, acting as County Fire Warden or City Fire Department also has responsibilities within designated state responsibility areas. These overlapping responsibilities are supported by agreements between levels of government. Consequently, the methodology employed is designed to:

1. Point out levels of risk and service being provided within specified areas of the County irrespective of jurisdiction.
2. Discuss "risk" as it relates to goals, thereby preparing a basis for development of safety standards, where scientifically possible; and consequently discuss risk relative to the formulation of policies designed to meet or exceed requirements of the state planning law (Sec. 63502.1).
3. Provide the necessary planning data required by the County Executive Officer and the Board of Supervisors for establishing funding levels for safety programs in future years.
4. Indicate the areas where knowledge should be expanded in order to more adequately address the subject of safety planning in the future.

II-C RECOGNITION OF HAZARDS

Fire Hazards

Tulare County is faced with two general types of fire hazards: wildland and structural improvements. Included in the wildland hazard is dry brush and weed accumulation around structures and vacant fields in urban or structurally occupied areas.

The California Division of Forestry recognizes five types of fire hazards including vehicles, since they are often called upon to rescue people trapped in vehicle accidents. California Division of Forestry classification includes: wildland, cropland, structures, improvements and vehicles.

In order to mitigate the fire hazards to life, property, and the natural environment, standards should be established for the following things.

(1) Structures - Stairwells; elevator shafts; electrical systems; heating systems; minimum setback; siding and roofing material; housing for the elderly and mentally and physically infirm; commercial and industrial enterprises; flammable materials and interiors; fire detection and suppression equipment; structural design; hospitals, fire stations and other critical facilities; and particularly hazardous structures such as petroleum and chemical storage facilities.

(2) Wildlands - Width of roads and right of way; road grade; curve radius of road; vehicular access to developed areas (e.g. providing at least two routes from a subdivision); length of cul de sacs; turning radius of dead end roads; modification or complete elimination of vegetation to create fuel break or fire break alongside roads and in some other areas of the wildlands; hydrant location and spacing; hydrant flow, supply and storage; water circulation system, safeguards for protection of hydrants; consideration of slope, weather and vegetative factors in structural and other land use planning.²⁸

The Public Resources Code Sec. 4291 requires minimum clearance around structures of not less than 30'.²⁴

Standards for both structures and wildland areas are contained in existing state law. Enforcement of these standards is reflected through the land division, environmental impact, zoning, building code and land use planning processes of local government.

Seismic/Geologic Hazards

Seismic/geologic and soil hazards are discussed in greater depth in Chapter III and in the Soils Element⁵¹ of the General Plan, as well as the Seismic Safety Element of the General Plan.³²

There are two basic classifications present in Tulare County:

1. Primary Natural Hazards - which includes potential ground shaking.
2. Secondary Natural Hazards - which include the interaction of ground shaking with existing ground instabilities (liquefaction, settlement, and landslides).

The Seismic Safety Technical Report contains three major conclusions:

1. No active faults are known to be present in the Tulare County area.
2. The principal earthquake hazard affecting the Tulare County area is ground shaking, as opposed to surface rupture or ground failure.

3. Known active faults that pose a serious ground shaking hazard to the Tulare County area include the San Andreas fault to the west, the Owens Valley fault group to the east, and possibly the White Wolf fault to the south.

Land uses are primarily affected by ground shaking, therefore, the recommendations included within the Seismic Safety Element are principally concerned with the Building Codes and recommendations for safety measures that can be taken by the Office of Emergency Services, Planning Department, Building Department, Engineering Department, and the Health Department.

Man-made Hazards

There are two large dams in the County, Terminus and Success, whose reservoirs when full, hold 150,000 and 80,000 acre feet of water respectively. In the event of the rupture or collapse of one of these dams, the loss of life and damage to property and the natural environment could be tremendous, depending upon the amount of water stored behind the dam at the time.

In order to assist local governments in establishing standards for land use in areas below dams, the State Office of Emergency Services (OES) and the Office of Planning and Research (OPR) have developed procedures by which local governments can obtain inundation maps prepared pursuant to Section 8589.5 of the Government Code. These maps should be available by early 1976.

Because of the potential risks involved, areas of possible inundation should remain largely rural and maintained in agricultural use.³⁹

The general criteria for establishing the standards to mitigate fire, seismic and flood hazards should be the minimization of risks primarily to persons, and thereafter to property and the natural environment. Consequently, efforts should be made to enable persons to safely and rapidly evacuate an area or a building and permit public safety agencies - police, fire and ambulance - to quickly and effectively provide assistance at the disaster scene.

Recognition of Hazards (other)

Other man-made hazards are discussed only briefly in this report. They include hazards associated with crime and nuclear as well as chemical/fuel hazard potential.

More sophisticated analyses of special problems related to crime and crime prevention are underway in Tulare County and the incorporated areas, primarily with assistance from the California Council on Criminal Justice utilizing Department of Justice, Law Enforcement Assistance and Administration (LEAA) funds. Through these types of studies and direct assistance programs, the incidence of crime can be reduced. There still remains a more difficult set of problems to resolve that can only be attacked with positive programs for recreation, reduction of poverty levels, and provision of jobs and where necessary, family assistance, in order to reduce the necessity for persons to engage in criminal activity.

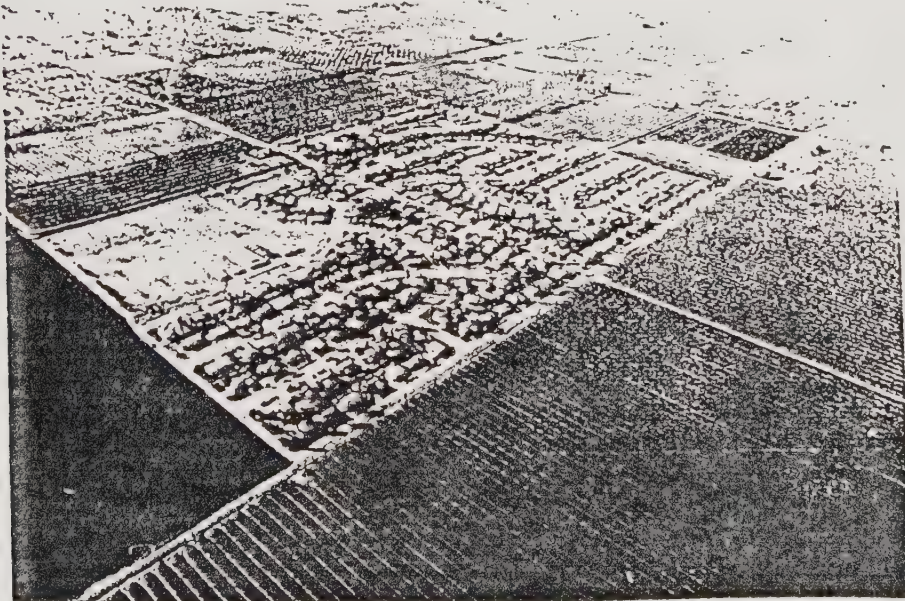
Recognition of Hazards (Disaster)

The Tulare County Office of Emergency Services is continually updating the contingency plans necessary for dealing with

disasters that are most commonly called "acts of God." An essential feature of the Emergency Plan for Tulare County is the centralization of authority, resources and communications systems during and immediately after a disaster. Hazards for which the Office of Emergency Services is prepared to deal with are numerous; consequently the "Plan" deals with procedures, responsibilities and ongoing inventories of resources that could be made available under most any type of disaster situation that the County would probably be faced with. The Office of Emergency Services is the primary communication/coordination point during and after disasters. Designation of evacuation routes is the Office of Emergency Services responsibility.¹⁶

Recognition of Hazards (Flood)

Flood hazard is delineated for major water courses in Tulare County (identified in bibliography).⁵⁵ The flood hazard studies were carried out in conjunction with the U.S. Army Corps of Engineers.



This isolated subdivision in the northwestern part of Visalia creates a problem for safety personnel who are expected to provide urban services in an area that is not yet fully urbanized. The street widths and subdivision design are adequate but the nearness to emergency services that these residential units

require is not adequate. Crime prevention in these outlying areas is also a major problem. Density in this subdivision should require at least a 3-mile 3-minute response capability by the fire protection service unit serving this area.

CHAPTER III

Introduction

For purposes of this study we have classified fire hazards into two main categories; wildland and structural.

Wildland fire hazards exist in the three-fourths of the County located in the Sierra Nevadas. The hazardous conditions arise from a combination of climatic, vegetative, and physiographic factors. Although wildland fires have occurred naturally from lightning for countless eons, man has drastically increased the number of wildland fires through his use of the wildland areas. People now account for nine out of every ten wildland fires.

Structural fire hazards are those that occur to residences, offices, factories, towers, and other man-made stationary objects. Structural fire hazards are due to improper design and use of materials, inadequate or nonexistent fire detection and suppression equipment, and misuse and improper maintenance of structures. Some structural fires are caused by refuse and wildland fires, but there are adequate precautionary measures that would greatly reduce the risk of such an occurrence.

There are three conditions that must be present for any fire to occur.⁴³ They are heat, fuel, and air. Following is a discussion of how these three elements interact to create fire hazards to wildlands and structures.

For purposes of this Element, "Wildland Areas" are considered to include the larger open spaces and agricultural lands that surround the incorporated cities and rural communities of the County.

Wildland Fire Hazards

The wildland areas, i.e., the Sierra Nevada, cover two thirds of the approximately 5,000 square miles of Tulare County. The western quarter of the County lies in the relatively flat and intensively cultivated San Joaquin Valley.

There are three distinct climatic zones in the County;²⁹ the valley area, the foothill area and the high Sierras. The general climatic type found here is termed "Mediterranean" characterized by hot, dry summers and cool, wet winters. The valley area has a hot and dry summer, with cooler temperatures and rain in the winter season. The average temperature ranges from about 46° F. in January to 82° F. in July. Annual rainfall in the valley varies about seven to ten inches, being generally higher near the foothills. Conditions are created in winter which cause

fog to form in the valley. Eighty-five percent of the precipitation in the valley occurs during the months of November through April, and the frost-free season usually exceeds nine months.

Natural vegetation in the valley consists largely of annual grasses; these are dry from late spring to early fall. Dry grasses pose fire hazards especially to structures located near such fields if minor adjacent clearing is not done.

The foothill area has climatic conditions which change in relation to elevation. The foothill elevations range from about 500 to 3,000 feet above sea level. Mean temperatures are slightly lower than the valley, while rainfall is greater, in the foothills than in the valley, oftentimes from two to four times as much at the higher elevations. Most of the precipitation, some of it snow, falls from October through late April. Vegetation in the lower foothills is grassland, but quickly gives way to woodland and chaparral at the higher elevations.

The mountain climatic region ranges in elevation from 3,000 to 14,495 feet (Mount Whitney). Up to about 9,000 feet the climate is characterized by warm, relatively dry summers and cool snowy winters. Annual precipitation, mostly in the form of snow, can be as high as 80 inches. Forests cover most of the mountainsides up to timberline, which is about 11,000 feet. There are frequent summer thunderstorms in the high Sierras, which often create lightning-caused wildland fires each year. Above 9,000 feet the summers are cool with the growing season being less than four months long. Snow covers the ground from November to May and even longer at higher elevations.

Of the three conditions that must be present for a fire to occur - heat, fuel, and air - the third factor is always present. Since the kindling temperature of wood is about 540° F. - far above any temperature produced from sunlight - greater heat must come from another source. In nature, lightning is that source. However, with people inhabiting the wildland areas and enjoying the recreational features of the mountains in greater numbers than ever before, people now account for nine out of every ten wildland fires.²² What determines the wildland hazard severity centers upon certain characteristics of fuel.

Vegetative Conditions 21,22

(1) Fuel loading - The quantity of flammable vegetation and other fuel per unit of land area. High fuel loading, i.e., a great quantity of fuel contributes to a high intensity fire.

(2) Moisture content - Since water does not burn, moisture must be driven from the vegetation before it will burn. Low moisture content creates a more critical fire hazard condition.

(3) Chemical content - Vegetation with high content of oils, esters, resins, and the like burn more readily and intensely than other types of vegetation.

(4) Others - Distribution of size classes, and arrangement and ratio of dead vegetation to living vegetation are two other important factors to consider in wildland fire hazard conditions. A high proportion of large size fuels and a high ratio of dead vegetation to living vegetation contributes to a high intensity fire, while a high proportion of small sized fuels result in a high rate of fire spread.

Ultimately, of course, fuel characteristics are determined by weather and topography.

Weather Conditions 21,22

There are four aspects of weather which influence fuel characteristics: precipitation (amount and occurrence); temperature; relative humidity, and; wind velocity and direction.

(1) Precipitation - Generally speaking, the greater the amount of precipitation, the greater the fuel loading. Also, the more even the distribution of precipitation, the less chance that the fuel will become dried out and susceptible to fire. However, with a Mediterranean-type climate, (in which most, if not all, of the precipitation falls during a five to six month rainy season from about November through April), vegetation dries out during the summer months. The degree to which this occurs depends upon these next three weather conditions.

(2) Temperature - During periods when there is adequate moisture for vegetation, temperature is a controlling factor in the creation and growth of plant fuel. There are optimum temperatures for plant growth, above and below which growth is inhibited by either heat or cold. When there is no longer adequate moisture for growth, temperature becomes a factor in altering

the acceptance or resistance of fuel to combustion. Of course, the higher the temperature, the lower the resistance of fuel to combustion. Temperature, in itself, is an important cause of fire; and important to the behavior of two other fire weather elements - humidity and air movement.

(3) Relative Humidity - The relationship between the moisture vapor in the air at any given time and the total it could hold at its present temperature is called - *relative humidity*. Dew point is the saturation point at any given temperature. Warm air holds more water vapor than cold air. However, if the amount of water vapor remains constant the relative humidity decreases as air temperature increases. Relative humidity below 30% creates a favorable situation for a wildfire, because less humid air is able to pick up water vapor from the vegetation, thereby reducing the moisture content of the potential fuel. Heavy fuels, such as logs, will give up their moisture slowly and they will reabsorb it slowly. Lighter, dry fuels will lose their stored winter moisture and then reflect a change in moisture content as air humidity causes water vapor to move into and away from the body of the potential fuels. Dry leaves and grass will respond quickly to the relative humidity of the air and will vary from hour to hour and day to day. Green, living leaves naturally respond in accordance with complex transpiration habits developed by each species.

(4) Wind Velocity and Direction - Wind influences fuel in three important ways: supplying oxygen; exerting pressure to move heat or fire, and; reducing fuel moisture by increasing evaporation.

a. Supplying oxygen - The more available oxygen becomes, the more rapidly will the fuel be consumed by flames. It has been estimated that one pound of fuel requires 200 cubic feet of air during combustion. Hence, the stronger the wind, the more fuel is supplied to the fire, and the faster the fuel is consumed.

b. Exerting pressure to move heat or fire - Wind pressure has a two-fold effect on fires: it pushes flames and sparks into new fuel, and; it can preheat fuel on the leeward side of the fire by forcing heated air in and around the fuel. Wind pressure increases much faster than wind speed. For instance, upon one square foot of surface facing a wind the following pressures will prevail:

Wind Velocity (miles per hour)	Pressure (lbs. per sq. ft.)
15	1.125
30	4.5
60	18.0

Wind may cause fires to jump prepared or natural barriers. Rough topographic objects and vegetation act as a drag upon ground wind movements. In rough topography the local wind courses may be quite different from the major prevailing conditions and also more changeable from time to time. Upslope winds will occur as a result of surface heating in the daytime and downslope winds will occur as the result of surface cooling at night. Strong up-canyon winds can be quite turbulent and will form large eddies at bends and tributary junctions. Fires burning in these locations will behave very erratically and may spread alternately one way and then another, but generally will move diagonally upslope.

Topographical Conditions ^{21, 22}

There are three aspects of topography which influence the fire hazard severity: exposure, elevation, and slope. These factors must be considered in relation to weather conditions and the resulting influence upon vegetation conditions as well.

(1) Exposure - South and southwest faces are subjected to higher temperature, lower humidity, and the rapid loss of available soil moisture. Consequently, a dry, light, flash-type fuel is produced.

"More fires have started and grown larger upon south slopes, especially in the hotter, drier parts of California, than upon northern exposures. An important link in the chain of reactions mentioned above is soil erosion. A lighter, drier vegetation on south slopes burns more easily, has more and larger fires, and leaves the soil exposed. Heavier rains on south exposures cause slow and sure (or rapid and dramatic) erosion of soil. Less moisture can be held in the remaining soil and only a poorer form of vegetation can live under the circumstances. Thus the trend of deterioration is on its way to half-barren desert as the possible result."

However, the north slope is not free of a potentially disastrous fire hazard. Though the period of time during which an extreme hazard exists is shorter than a south-facing slope, the fact that more moisture persists permits a greater amount

of plant fuel to grow. When the dry condition does develop on such slopes, the potential fire hazard becomes greater than on a south-facing slope.

(2) Elevation - Generally speaking, the higher the elevation, the less chance of a fire occurring. With increasing elevation, temperature decreases. This has effects upon precipitation, relative humidity, and vegetation types, which have been discussed previously. Likewise mentioned was the fact that due to thunderstorms at the higher elevations, the number and location of fires starting from lightning is just about in reverse of the above rule.

(3) Slope - Fires tend to burn faster going uphill than downhill. Upslope fuel is actually closer to a fire than downslope fuel. Hot air from fires rise, therefore, uphill fuel will be heated sooner than downslope fuel.

Topography ^{21, 22}

"A few general rules of air movements probably will prevail in respect to fire behavior and slopes, for instance:

In a wide canyon the prevailing wind will not be deflected by any sharp up or down draft in the course of the canyon. The wider the canyon the less the danger of fire spotting across to a different slope.

Narrow canyons are more likely to have independent wind currents than wider ones. Sharp breaks and forks in the canyon may produce turbulent drafts. Fires are more inclined to spot across such canyons.

The steeper the slope the more likely is the fire to drive upward in a narrow head, with possibly an in-draft on the flanks. Spot fires ahead of the main fire are likely.

At the crest of a slope it is normal for the fire to meet an opposing air movement sweeping upward from the other side of the hill. It is the most logical place to stop and hold an upslope fire."

Wildlands Classification System ^{21, 22}

A Fire Hazard Severity Classification System for California's Wildlands was developed by the State Division of Forestry in a report dated April 1, 1973, and presented to the Governor's Office of Planning and Research. The classification

system is intended to aid local government land use planning agencies in identifying and classifying areas of varying severity of fire hazard, and to specify the conditions under which development and use of these areas may occur so that damages from encroaching wildland fires could be kept to an acceptable level. For a more thorough explanation of the classification system, the report itself should be consulted. The report further recommends the conditions under which development and use of the areas should occur.

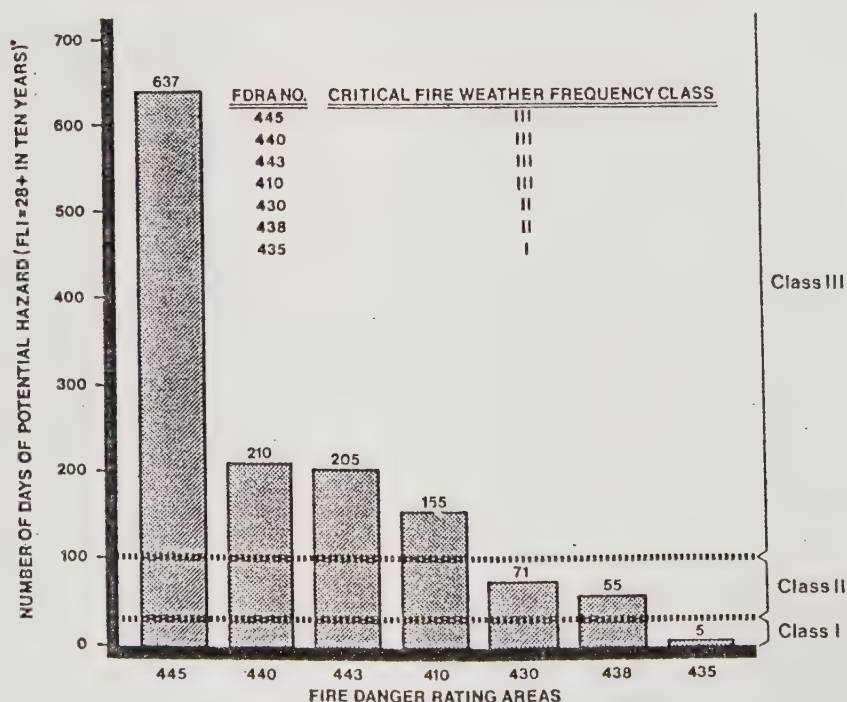
A discussion of the factors which influence the degree of fire hazard has already been presented. The following is a presentation of how fuel loading (the quantity of flammable vegetation and other fuel per unit of land area), fire weather, and slope are used as the primary criteria for identifying and classifying fire hazard in varying degrees of severity.

Fuel loading (in terms of wildland vegetation types) - From USGS 7-1/2' and 15' quadrangle maps, vegetation types have been mapped to the nearest 40,000 square feet. Three classifications of vegetation are important to fire hazard: (see FLI table below)

Fire Weather - There are three classes of weather. Each class is related to the frequency of critical fire weather days occurring in each of the Fire Danger Rating Areas over a 10-year period. A Fire Danger Rating Area (FDRA) is a geographical area of similar climate.

Critical fire weather days are determined from measurement of a number of important weather elements: wind; relative humidity; precipitation (its annual total, seasonal distribution, and storm intensity). The combined effects of weather elements on potential fires for each FDRA are calculated daily as a series of indexes, defined in California's Interagency Wildland Fire Danger Rating System. This system predicts the probability of a fire occurring (Fire Occurrence Index - FOI), and, should a fire occur, its probable rate of spread and intensity (Burning Index - BI). These two indexes are combined into a Fire Load Index - FLI, on a linear scale of 0-100, which estimates the potential job load each day for each FDRA. An index of 28 to 39 means that the expected fire load is "Very High," and an index of 40 to 100 is "Extreme" (the highest classification). The most critical weather factor in the system is wind, because of its important effect on fire behavior.

FIRE DANGER RATING AREAS BY FIRE LOAD INDEX FOR TULARE COUNTY



*FLI: FIRE LOAD INDEX

Prepared by Tulare County Planning Department

Source: California State Division of Forestry, 1973

A slight increase in wind velocity causes a considerable increase in the Burning Index and hence in the Fire Load Index.

The daily FLI was examined for all FDRA's for the months of June through December over a 10-year period (1958-1967). A FLI of "28 or more," which includes both the "Very High" and "Extreme" fire danger classes, was selected as identifying fire weather having a high probability of producing high intensity conflagrations.

After considerable study, search of the literature, and counsel with wildland fire behavior experts, it was decided to rank the FDRA's into three Critical Fire Weather Frequency Classes for the purpose of classifying areas of varying severity of fire hazard.

The categories indicate that some areas within Tulare County should be carefully planned to avoid potential high fire hazards. The categories (although conservative) when matched with fire incidence patterns for the years selected, give an indication of risks presently being incurred due to fire.

CRITICAL FIRE
WEATHER FREQUENCY
CLASS

CLASS
SPECIFICATIONS

I:	Those rating areas which averaged less than 1 day per year of FLI = 28 or more.
II:	Those rating areas which averaged from 1.0-9.5 days per year of FLI = 28 or more.
III:	Those rating areas which averaged 9.6 or more days per year of FLI = 28 or more.

There are seven FDRA's in Tulare County. Six extend beyond the boundaries of the County. They are shown on the map titled Fire Danger Rating Areas. The table opposite shows the FLI and Critical Fire Weather Frequency Class of each Fire Danger Rating Area.

For purposes of determining the wildland fire hazard severity apply the following table:

CRITICAL FIRE WEATHER FREQUENCY CLASS	FIRE WEATHER SEVERITY FACTOR
I	1
II	2
III	8

A positive correlation was found between the distribution of large fires and the Critical Fire Weather Frequency Class of the FDRA in which they occurred in the State. (See chart titled "Distribution of Large Fires by Critical Fire Weather Frequency Classes.")

Although the figures include the entire State, it is reasonably safe to assume that the correlation between the Critical Fire Weather Frequency Class and the distribution of large fires would not differ remarkably from those at the County level.

At best, the Critical Fire Weather Frequency Classes provide probability indexes suggesting how often critical fire weather can be expected to occur in any given area. Assuming risk and fuel to be constant, they can be used also as probability indexes for large fire occurrence.

Slope - The influence of slope on fire behavior has been explained earlier. Generally speaking, small fires will burn faster up slope and slower down slope. Therefore, the conversion factor for determining the fire hazard severity has been based upon the percent of slope. Again, there are three classes. The following table relates the slope class to the conversion factor:

SLOPE CLASS	% SLOPE	CONVERSION FACTOR
I	0-40%	1.0
II	41-60%	1.6
III	61+%	2.0

The basis for determining the percent slope for each slope class was the capabilities of fire attack units to suppress a fire. The following chart shows this correlation.

Summary of factors and their assigned values in development of the Fire Hazard Severity Scale:

Fuel Loading

FUEL LOADING CLASS	FUEL SEVERITY FACTOR
Light (Grass)	1
Medium (Scrub)	8
Heavy (Trees-Brushwood)	16

Weather

CRITICAL FIRE WEATHER FREQUENCY CLASS	FIRE WEATHER SEVERITY FACTOR
I	1
II	2
III	8

Slope	
<u>SLOPE CLASS</u>	<u>SLOPE SEVERITY FACTOR</u>
I (0-40%)	1.0
II (41-60%)	1.6
III (61+%)	2.0

"Having assigned Severity Factor values to each criterion affecting wildland fire hazard, these values next then were combined into a Fire Hazard Severity Scale which could be used to classify areas with varying degrees of fire hazard. This was accomplished by multiplying the Severity Factors in matrix form. The products gave a range of values from 1 to 256, shown in the table titled "Fire Hazard Severity Scale." It was decided to divide this range of values into three fire hazard classes on the basis that three classes were all that could be handled with reasonable ease by local government land use planners. Three classes were also a practical number from the standpoint of specifying different conditions under which land use and development should take place in the wildlands."

Although the three classes of fire hazard were established by arbitrarily dividing the matrix values in the "Fire Hazard Severity Scale" table, it is felt that:

- (a) The resulting class designation is logical in relation to expected fire behavior and potential fire damages;
- (b) It will withstand the scrutiny of fire behavior experts, fire protection planners, and land use planners, and
- (c) It will prove useful to all of them.²²

Conditions for Use and Development of Areas of Varying Fire Hazard - It is recommended that the County apply the Fire Hazard Severity Scale to proposed development or uses within wildlands, and that the following minimum requirements be met in relation to the three classes of Fire Hazard Severity:

Moderate Hazard - Strict compliance with existing State statutes and local ordinances should provide adequate fire protection. State statutes would include Public Resources Code, Sections 4291-4296 and Sections 4371-4375.

High Hazard - Requirements should range between a minimum of the Public Resources Code, Sections 4291-4296 and Sections 4371-4375, and a maximum of the Fire Safe Program.

Extreme Hazard - Minimum requirements should be equal to the Fire Safe Program. In addition, specific protection requirements should be designed for the area involved.

The above recommendations are conservative. Special conditions, even in areas of "Moderate Hazard," may exist which may demand special and specified requirements under which development or use of the area should occur.

For example: Homes should not be built on slopes with a grade over 60% or in topographic "chimneys" or in box canyons without an in-depth study to determine exceptional fire protection precautions to be taken. Soil erosion is a factor which must be considered as well and the Soils Element of the Tulare County General Plan should be reviewed for further information regarding soil types, conditions and hazard potential.

Building construction codes should be uniform for all wildland areas and should be designed to fit specific wildland conditions.

Widths of fuel clearance along roadways, as well as around buildings, are a function of fuel height, slope, and topographic "shape of the land." Subdivision and land division procedures should include close coordination with the County Fire Warden.

Water supply systems must be related to the size and configuration of the land development.

A total systems approach must be taken in relation to fire protection engineering - a task meant only for a person experienced in fire protection requirements.

It is most important that proposed developments or uses in the wildland areas be subject to review by the local fire agency responsible for protecting the development. After a thorough study of the possible hazard and risks that would be associated with completion of the facilities and then eventual use and the problems involved in protecting the structure or use from fire, the local fire agency should require that fire prevention and possible suppression standards be met.

Development proposals passed by the Board of Supervisors or Planning Commission require that fire standards be taken into consideration and met, particularly in critical areas and in conjunction with critical facilities.

FIRE DANGER RATING AREAS
AND FIRE INCIDENCE PATTERNS

Fire Danger Rating Area Numbers on the adjacent map refer to designated zones from the original research material so that the reader can refer back to this material that was prepared by the California Division of Forestry. This map refers primarily to critical fire weather frequency. In order to adequately assess fire danger it is necessary to correlate this information with vegetative and slope (terrain) characteristics when addressing any particular development. Incidence patterns indicate that fires often occur adjacent to roads and on stream bottoms where people live or find recreation.

The critical fire weather frequency class is shown and it is indicated in either class I, II or III. Class III includes the most severe wildland fire danger areas in the County.

The years 1970, 1971, and 1972 were chosen to describe incidence due to extremity in characteristics. The year 1970 was considered a light incidence year, while the year 1972 was considered a heavy incidence year. 1971 was an average year.

For the valley floor a different technique was used for plotting incidence. Since the incidence pattern did not vary significantly from the years 1965 through 1973 in appearance, the year 1971 was selected since it was an average incidence year in terms of fire hazard. It should be noted that there are an average of over 1,600 calls made by the California Division of Forestry or the County Fire Warden in any given year. It can be seen from the pattern that major arterials are related to incidents. The pattern is quite heavy along Highway 99 as it goes from north to south through the County. High incidence rates surround urban areas. The greater the density and the greater the number of dwelling units in a given area the higher the number of incidents. This is discussed in the text and seems to be verified by the figures and the patterns that emerged as the mapping was completed.

There are scattered incidents in other parts of the valley floor particularly around the area of Yettam and Seville. Some of these incidents are related to vandalism and lack of weed abatement.

In the southwest portion of the County the service area of the fire stations is not adequate. Structures are not inspected regularly or adequately and abatement programs are not carried out thoroughly.

The lines A-A' and B-B' refer to cross-sections that were drawn through the County to show the kinds of values that are held to be important by residents and visitors alike. This illustrates some of the many ways to evaluate fire service "need."

FIRE DANGER RATING AREAS AND FIRE INCIDENCE PATTERNS

TULARE COUNTY

LEGEND

FIRE INCIDENCE PATTERNS

MOUNTAIN AND FOOTHILL ZONES - DATA FOR PERIOD 1970-72

- VEGETATION
- STRUCTURAL
- ▲ OTHER

VALLEY ZONE - DATA FOR 1971

- ONE INCIDENT

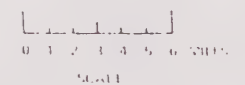
FIRE DANGER RATINGS

CRITICAL FIRE WEATHER FREQUENCY	FDRA NO.
CLASS I	435
CLASS II	430 438
CLASS III	410 440 443 445

(Lines A-A and B-B refer to cross section profiles)

Sources: • U.S. Department of Agriculture
Department of Forestry
• U.S.D.A. Forest Service, Pacific SW Forest and Range
Experiment Station, Berkeley, California
• U.S. Park Service
• U.S. Department of Interior
Bureau of Land Management
• U.S.D.A. National Forest Service
• California Division of Forestry
County Fire Warden

November 1974



PREPARED BY TULARE COUNTY PLANNING DEPARTMENT

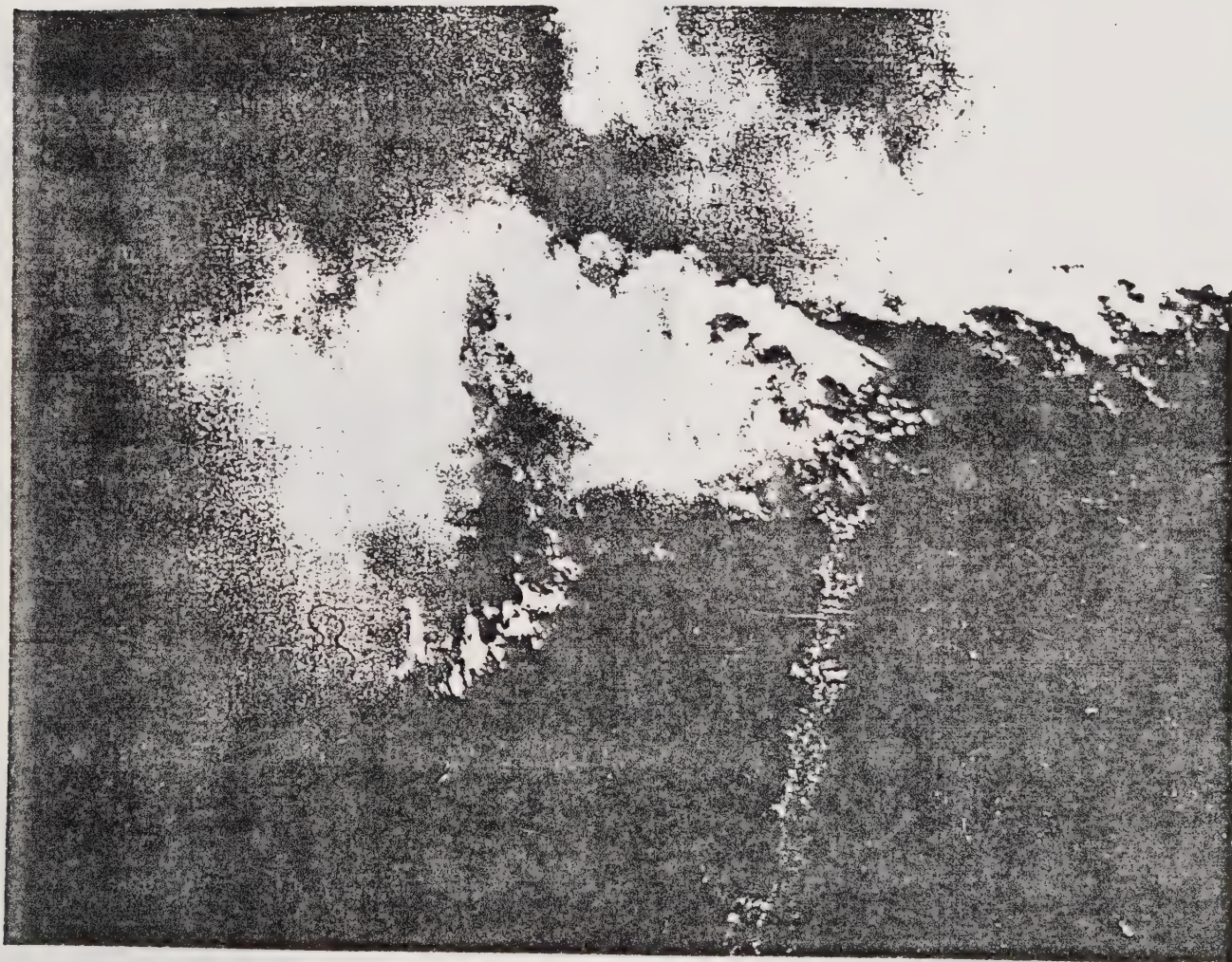


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Aerial attack planes are maintained by the United States Forest Service and the California Division of Forestry at Porterville and Fresno air terminals. These planes are capable of attacking fires in regions where roads do not exist and access is difficult. Chemical retardants can be used to slow down or stop fires from spreading out of control in many cases. Communications play a vital part in this kind of operation. In this case, the trees are most likely ponderosa or yellow pine and the fire is moving in the top of the trees thus creating an even more difficult situation for fire fighters on the ground. Valuable resources are lost and potential for loss of homes and resource extraction facilities is

great in areas located far out of range of fire fighting equipment. A typical example would be a lumber yard in the mountain areas of Tulare County, particularly on the eastern slopes where road access is inadequate and lightning fires are common. On the map titled "Fire Danger Rating Areas and Fire Incidence Patterns," note the scattered pattern of fire activity in the southeastern portion of Tulare County. Most of these fires are due to lightning activity. The necessity for maintenance of a first class fire fighting service is important not only to the environmental resources of Tulare County but also to the economic base of the County.



The picture above shows a wildland fire in the foothill region of Tulare County that has breached the fire service road. These fire service roads are usually located on the crest of mountains where fire can most easily be contained. This fire is the result of an updraft or chimney condition that has caused the fire to move rapidly up the mountain slope, thereby making it more difficult to control. In addition, chaparral, having a high fire susceptibility due to its drought capacity makes excellent fuel for the fire. Most forms of chaparral can adapt to fire in that they regenerate rapidly from the crown or possess seeds that are stimulated to germinate by heat and consequently come up in large numbers after a fire. Such species regenerating from the crown would include chamise, scrub oak, toyon, mountain mahogany, *Arctostaphylos glandulosa*, and *Ceanothus*

leucodermis. They are usually deep rooted and are undoubtedly very long lived..

This stand of chaparral in the photograph appears to be rather young and contains more of the chaparral that is commonly known as soft chaparral. The distinction between hard and soft chaparral is primarily related to the climatic conditions in which the vegetation is found. Herbaceous plants often adapt to the habitats temporarily available after fire. It is difficult to attribute any long range effect on the composition or distribution of our chaparral lands to the factor of fire alone. Ecology and history tell us that precipitation is the critical factor that determines whether the soft or hard chaparral will survive in a given area at any particular time.

VEGETATIVE FUEL LOADING FACTORS 21, 22

TYPE	USGS DESIGNATION	FUEL LOADING CLASS	DEFINITION	AVERAGE FUEL LOADING TONS/ACRE	FUEL SEVERITY FACTOR**
Woods-Brushwood	Solid Green	Heavy	Growth at least six feet and crown density 20% or greater	36.96	16
Scrub	Stippled green	Medium	Low growing or stunted perennial vegetation; crown density 20% or greater e.g., cactus, mesquite, sagebrush, usually not trees	17.33	8
Open	Uncolored	Light	Grass, annual herbs, irrigated fields, barren land	2.22	1

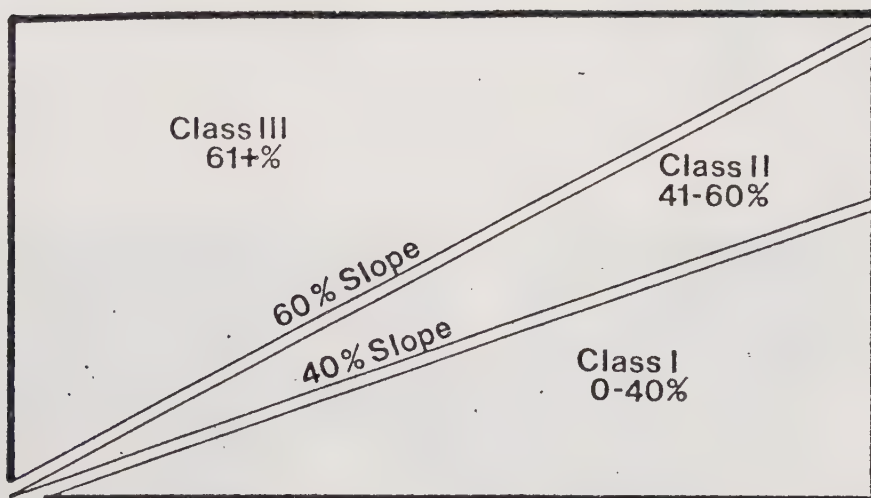
Prepared by Tulare County Planning Department

Source: California Division of Forestry

**For use in determining the wildland fire severity hazard.

Map titled Fire Danger Rating Areas and Incidence Patterns indicates location of cross sections or "profiles." Typical and unique characteristics of Tulare County are shown in conjunction with FDRA values. Note on profiles that both tangible and intangible values are noted. Rare and endangered biological species are indicated and a more complete listing of biologically unique and significant species to be found in Tulare County is to be found in Appendix "D" the Draft Environmental Impact Report.

SLOPE CLASS



CORRELATION OF CALIFORNIA'S WILDLAND FIRE DANGER RATING SYSTEM SLOPE CLASSES WITH FIRE ATTACK UNIT CAPABILITIES.

SLOPE CLASS I - DIRECT ATTACK POSSIBLE WITH ALL-WHEEL DRIVE FIRETRUCKS, BULLDOZERS, HANDCREWS AND AIRCRAFT.

SLOPE CLASS II - BEYOND OPERATING CAPABILITY OF ALL-WHEEL DRIVE EQUIPMENT. DRIVE ATTACK METHODS STILL POSSIBLE WITH BULLDOZERS, HANDCREWS, AND AIRCRAFT.

SLOPE CLASS III - MOSTLY BEYOND OPERATING CAPABILITY OF BULLDOZERS. ATTACK METHODS BECOME MORE INDIRECT. HANDCREWS AND AIRCRAFT BECOME PRIMARY TOOLS.

SOURCE: A fire hazard severity classification system for California Wildlands.

FIRE HAZARD SEVERITY SCALE

Critical Fire Weather Frequency	I (1)			II (2)			III (8)		
Fuel Loading	Slope %			Slope %			Slope %		
	0-40 (1)	41-60 (1.6)	61+ (2.0)	0-40 (1)	41-60 (1.6)	61+ (2.0)	0-40 (1)	41-60 (1.6)	61+ (2.0)
Light (Grass) (1)	1	1.6	2	2	3.2	4	8	12.8	16
Medium (Scrub) (8)	8	12.8	16	16	25.6	32	64	102.4	128
Heavy (Woods-Brushwood) (16)	16	25.6	32	32	51.2	64	128	204.8	256

1-12.8 Moderate Hazard

16-32 High Hazard

51.2-256 Extreme Hazard



The Giant Forest is world renowned for its beauty and the age of the trees found there. Sequoia and Kings Canyon National Park contains some of the most unique biological resources to be found anywhere in the world. These trees are not free from fire hazard and on occasion must be protected by man when lightning or other causes of fire endanger their habitat. The national park areas within Tulare County contain some of the most valuable tourist and recreation features of the Sierra Nevada Mountains. They represent a value to not only people in Tulare County but the people all over

the state and the nation. Primary responsibility for protection of these areas lies with the National Park Service but when assistance is needed joint agreements provide for County and State support as necessary to help in controlling forest fires in the national parks. In this photograph some of the older trees can be seen lying around on the ground, having been cut at a previous time but not harvested. This is known as "slash material" and can often provide added fuel to a fire.



Wildlife suffers from fires and Tulare County is rich in wildlife habitat. The Biological Resources Element as adopted by the Planning Commission, describes the various types of wildlife that are endangered or rare and that frequent Tulare County. This photograph shows a young deer destroyed in a wildland fire. Deer migrate from the higher Sierras down to the foothill areas in the fall. They are often subject to brush and grassland fires at the lower elevations. In the higher elevations, escape from fire danger for many animals becomes more difficult due to the terrain and the rapid rate at which fire ascends steep mountain slopes. It is difficult to estimate the number and kinds of animals or wildlife

that are destroyed each year by fire. The amount of habitat can be ascertained and limitations of the habitat often depend upon the species of animal and the way in which it adapts to new environment. Deer populations can become overly large and destroy a habitat by themselves. To some degree natural fires have limited wildlife populations in some areas. Fires also increase wildlife habitat on occasion particularly where, in the high mountain meadows of Tulare County, trees begin to overtake the grassland areas. If additional grasslands are provided then more wildlife can often exist, especially on the fringe zones of a biological community where the most activity normally occurs.

CHAPTER IV

Structural Fire Hazards

Structural fires pose a greater threat to life and property in Tulare County than do wildland fires. Structural fires represented 15% of the fires in the County in the last 10 years, as opposed to 26% wildland. Moreover, since most of our time is spent within structures - homes, offices, factories - the level of risk is higher. (These figures do not include incorporated areas with separate fire departments.)

The table below lists the various causes of structural fires in the United States and the percent of fires and the percent of dollar losses from the various causes as estimated by the National Fire Protection Association.

ESTIMATED CAUSES OF FIRES IN BUILDINGS IN U.S.*

	<u>% of Fires</u>	<u>% of \$ losses</u>
Heating and cooking	16	8
Smoking and matches	12	4
Electrical	16	12
Rubbish, ignition source		
unknown	3	1
Flammable liquid fires and explosion	7	3
Open flames and sparks	7	4
Lightning	2	2
Children and matches	7	3
Exposures	2	2
Incendiary, suspicious	7	10
Spontaneous ignition	2	1
Miscellaneous known causes	2	6
Unknown	17	44
TOTAL	100	100

* National Fire Protection Association Estimates

Most fires are due to carelessness or negligence of people, and some are even caused by deliberate action. In the County, 50 lives have been lost, 250 people have been injured and \$12,560,000 worth of property has been destroyed or damaged (within the last 10 years between 1964-1974)

Population forecasts indicate that as many as 224,300 people will live in the County by 1980 and perhaps 267,300 by 1990. As population increases within the County, a greater risk level occurs, both to the people themselves and the environment. (Population estimates from Department of Finance - Series D - January 1974.)⁹

There are several questions which the residents of the County must find acceptable/suitable answers to. Are the residents of the County willing to accept the present risks to life and property based upon the present losses and allocation of funds? If not, what should be done about it? Should more emphasis (real money) be placed upon fire inspection and/or fire prevention? More on increasing the fire suppression forces, i.e., more firemen,

equipment, or more fire stations? Or perhaps, more emphasis should be placed upon the responsibility of property owners to make their property more fire proof or provide for fire detection and/or suppression equipment systems in their home, office or factory.

One thing is clear, there is no simple answer or solution to the questions posed. All have certain advantages and disadvantages.

Private Efforts

It is not unreasonable to expect private citizens to put some effort toward prevention of fire and disaster by including suppression devices within buildings. This would eventually lead to fewer fires, less loss of life, and fire department^{8, 40} staff could be more closely involved in efforts to educate the general public on making structures and facilities safer. *The 1973 Uniform Fire Code is recommended as being appropriate for the County to adopt in order to allow for more adequate structural safety and continuing maintenance of safety requirements.*⁵⁷

There are five ways of altering the built environment to reduce structural fire hazards:

- .Improve fire safety technology
- .Change the type of materials used in the structure
- .Change the building design and construction
- .Change the code regulation and enforcement
- .Add automatic fire detection and suppression devices

Materials

Those who think only of a building's basic structure (not its contents) are satisfied (mistakenly), that the materials - concrete, steel, glass, aluminum - are indestructible by fire. Furthermore, people tend to take for granted that those who design buildings, always do so with adequate attention to their safety. That assumption, too, is incorrect.⁴³

Inadequately protected, structural elements of steel or concrete may still collapse if a fire is intense enough. Aluminum can melt and ignite flammable materials. This occurred at McCormack Place, a large "fireproof" exhibition hall in Chicago in 1967. Exploding gases from the incomplete combustion of synthetic materials can knock out plate glass windows. Wooden structures have long been recognized as being fire hazards, but their relative ease and cost of construction have made them popular.

Burning silk and wool release deadly quantities of carbon monoxide and cyanide gas and these and many other natural materials ignite at lower temperatures than many synthetics do. Plastics manufacturers contend that synthetics based on carbon, hydrogen, and oxygen exclusively are generally no more toxic when burned than natural materials. On the other hand, other synthetics containing sulfur and the halogens (chlorine, bromine, fluorine, iodine) are not so hazardous.

The contribution of plastics to the fuel load (i.e., quantity of combustible material) in buildings, (especially older buildings where fires occur more frequently), is certainly under 10%, but their use is increasing. Recently synthetics have been replacing wood, glass, cotton and wool, to name just a few. Plastics are used more today because they offer many advantages to manufacturers and consumers alike.

What makes plastics relevant to our discussion of materials is not only that many of them have introduced hazards previously uncommon, but that they are sold and used without adequate attention to the special fire hazards they present. So reports the National Commission on Fire Prevention and Control. Moreover, even materials tested for flammability under laboratory conditions may indicate higher resistance to fire than would actually be the case when used in real situations.

Efforts to make materials fire-retardant, that is, with less tendency to ignite or spread flames, may increase the hazard to life, since the incomplete combustion of many materials treated to increase fire retardation often results in heavy smoke and toxic gases.

There are additional problems with making materials fire retardant:

- .Additives are generally costly
- .Additives can reduce strength and weather resistance of material to which they are applied
- .Additives often lose their effectiveness through washing or prolonged exposure to climates
- .The smoke given off by many of these materials damages other materials

Efforts to make fabrics waterproof often result in making them more flammable.

Although it would be impractical for the County to establish its own materials testing laboratory, a task best handled at the federal level, the County and the

cities should, nevertheless, upgrade their building and fire codes to incorporate the most recent findings of the flammability tests of materials by nationally recognized testing laboratories. The 1973 Uniform Fire Code would be of great value to fire engineers if adopted by the Board of Supervisors and a plan for enforcement be developed by the County Fire Warden.

The economic interests of manufacturers, installers, vendors, and others often run counter to stringent fire safety requirements. For example, untreated wood shingle roofs have not been outlawed by building codes because of industry pressures and public preferences, despite their potential for spreading fire.

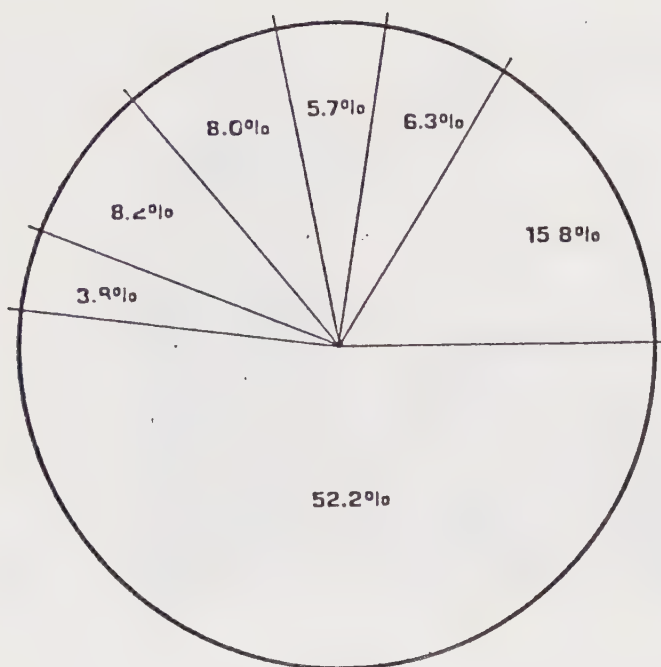
Some materials are not covered by building codes. The fire safety requirements of existing building codes apply mostly to construction materials and interior materials used on walls and ceilings. Comparatively little attention has been paid to floors and floor coverings, since in the past their contribution to fire spread was minimal. The advent of synthetic rugs and tiles has made greater attention to floor coverings imperative.

Interior furnishings are not covered by fire prevention aspects of the building codes, and only minimally by fire prevention codes. Moreover, seldom do fire prevention codes apply to private dwellings. Interior furnishings are not regulated partly because they are felt to be the responsibility of the owner or tenant and partly because, until recently, there was no motivation to develop tests on which to base code provisions. They would, indeed, be difficult to regulate, since they are subject to continuing change. Perhaps the most positive role to be played in regard to household and structural fire reduction is through educational procedures and private incentive programs.

While furnishings are likely to remain outside of code provisions, the fact that they contribute significantly to combustion hazards means that building codes only partly satisfy the demands of fire safety. No environment is without some level of risk.

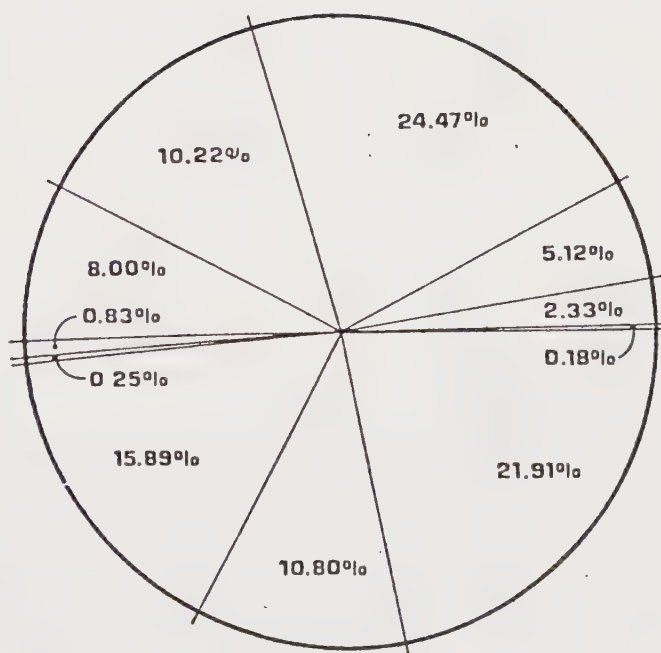
Because the measures for mitigating the fire hazards of materials are interwoven with those measures which should be taken regarding structural design and personal hazards, they are listed in the summary of recommendations within Chapter One.

STRUCTURAL FIRES BY CAUSE

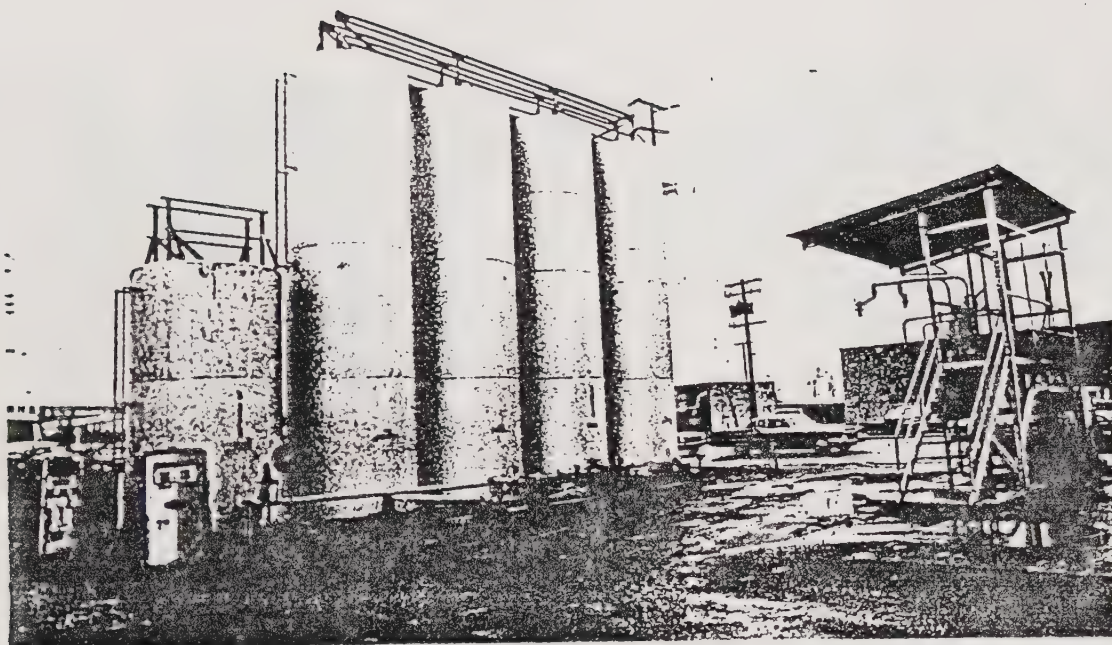


6.3% SMOKING
 15.8% INCENDIARY
 52.2% MISCELLANEOUS
 3.8% DEBRIS BURNING
 8.2% EQUIPMENT USE
 8.0% PLAYING WITH FIRE
 5.7% UNDETERMINED

FIRE CAUSES

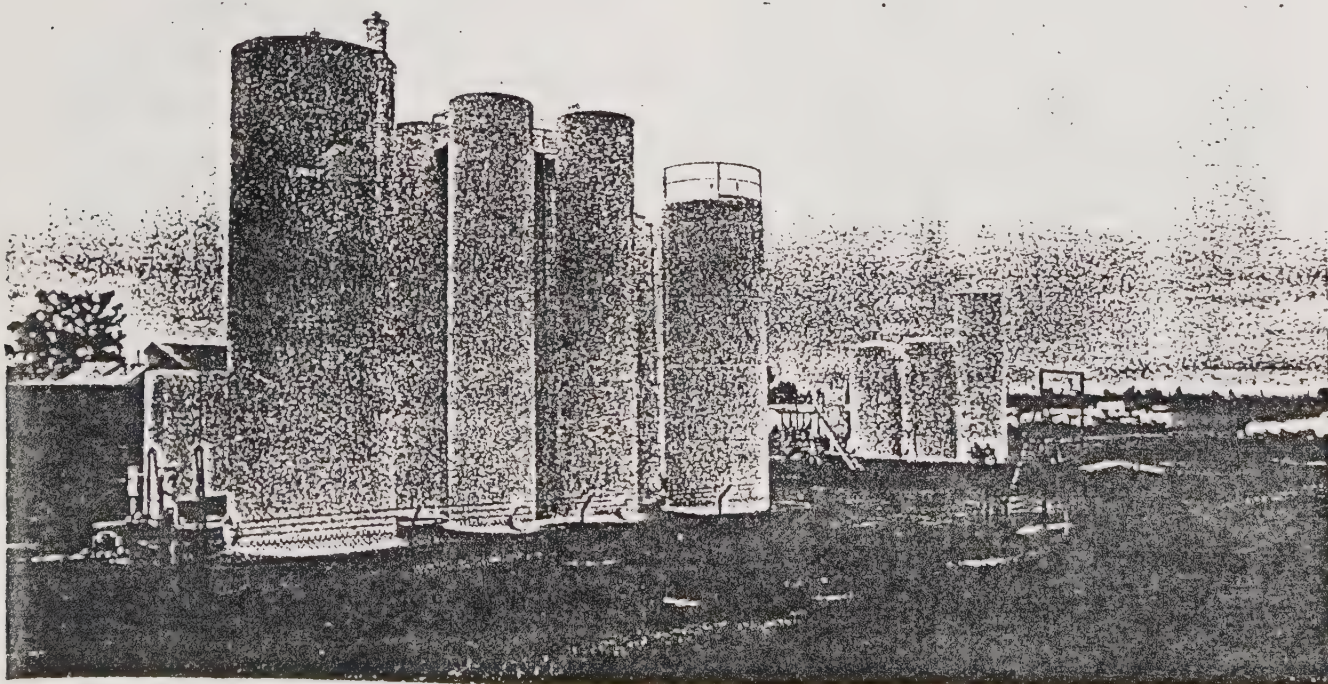


24.47% INCENDIARY
 5.12% UNDETERMINED
 2.33% ELECTRIC POWER
 0.18% LIGHTNING
 21.91% EQUIPMENT USE
 10.80% PLAYING WITH FIRE
 15.89% MISCELLANEOUS
 0.25% CAMPFIRE
 0.83% RAILROAD
 8.00% SMOKING
 10.22% DEBRIS BURNING



An agricultural economy requires the use of fuels and chemicals in large quantities. In this case both chemicals and fuels are stored in both rural and urban areas. Within the urban area there are potential hazards related to safety. In the photograph above, fuel storage is located too close to the highway for comfort. In the photograph below, fuel/chemical storage is located in a rural area where

containment of fire or disaster, should these facilities fail, is made somewhat easier. Environmental hazards occur when these kinds of facilities are damaged and toxic materials get into the water systems. Safety personnel must maintain an ongoing inventory of facilities such as this in order to respond effectively to safety needs that these facilities require.



Consumers use materials with inadequate knowledge of their combustion hazards. Except for flammable liquids and the materials that are used in appliances and wiring, few of the materials that go into the home carry labels indicating their fire resistance or warning of their fire or smoke/vapor hazard.

Because of the lack of general knowledge about the fire hazards of most materials and the wide range of uses, arrangements, combinations and concentrations of materials for structural purposes and for furnishings, consumers must become increasingly fire cautious and fire conscious. Installation of adequate heat and smoke detectors to warn the occupant and, in some cases, even to alert the fire department, would be wise. Installation of adequate on-site suppression devices capable of extinguishing the fire or at least containing the fire until fire fighting agencies arrive would also appear to be a wise investment. Just these two measures would go far in reducing the risks to life and property from the fire hazards associated with materials.

Building Design and Construction

Fire safety lags behind other considerations, such as economy and aesthetics, in the design of buildings. Sealed windows help insure that the heating and air conditioning systems will work more efficiently, but in a fire they can hold in the heat and hot gases of the fire and make it more difficult for persons trapped inside to escape through such windows. Elevators that cease to function during a fire can also be a death trap for occupants. Stairways may become overburdened with masses of people trying to escape a fire. In many homes stairwells help to carry fire and smoke upward to sleeping areas. In addition, the design of upper floors, especially private residences, are drawn up with little concern for alternate fire escape routes should the only stairwell be aflame or filled with billowing smoke. Often a door separating kitchens and water heaters from bedrooms can mean the difference of a few minutes needed to escape from a burning dwelling during the night.

Structures situated in the wildland areas of the County face particularly hazardous conditions. Not only must they be designed to reduce the risks of fire originating from within the structure, the architects and builders must also be acutely aware of the design, siting, and use of materials to reduce the risk of being engulfed in flames from a possible wildland fire.

Particularly flammable building materials such as wood used for siding and roofing could result in a structure being damaged or destroyed by a wildfire. There are a number of measures which could be taken to drastically reduce the risk from a wildland fire.

Fire-resistant asphalt shingles and stone, brick or cement block walls could be used in place of wood. Noncombustible eaves eliminate the risk of a fire burning next to a structure igniting the roof. Adequate brush clearance and other measures to reduce fuel loading around structures could be undertaken as required and recommended by Public Resources Codes 4291-4296 and 4371-4375. Enclosed foundations eliminate the hazard of brush accumulating under the structures.

Fire safety analysis is lagging behind innovation in building design. For example, there is an understandable trend toward ever-lighter structural members which reduce cost without significantly reducing strength of structures. Building designers introduce these innovations while two important questions go unanswered. First, are the structural members adequately protected from fire for the entire life of the building as well as during a fire that may occur tomorrow? Second, are existing tests for fire safety adequate for measuring the fire protection afforded by the particular innovation?

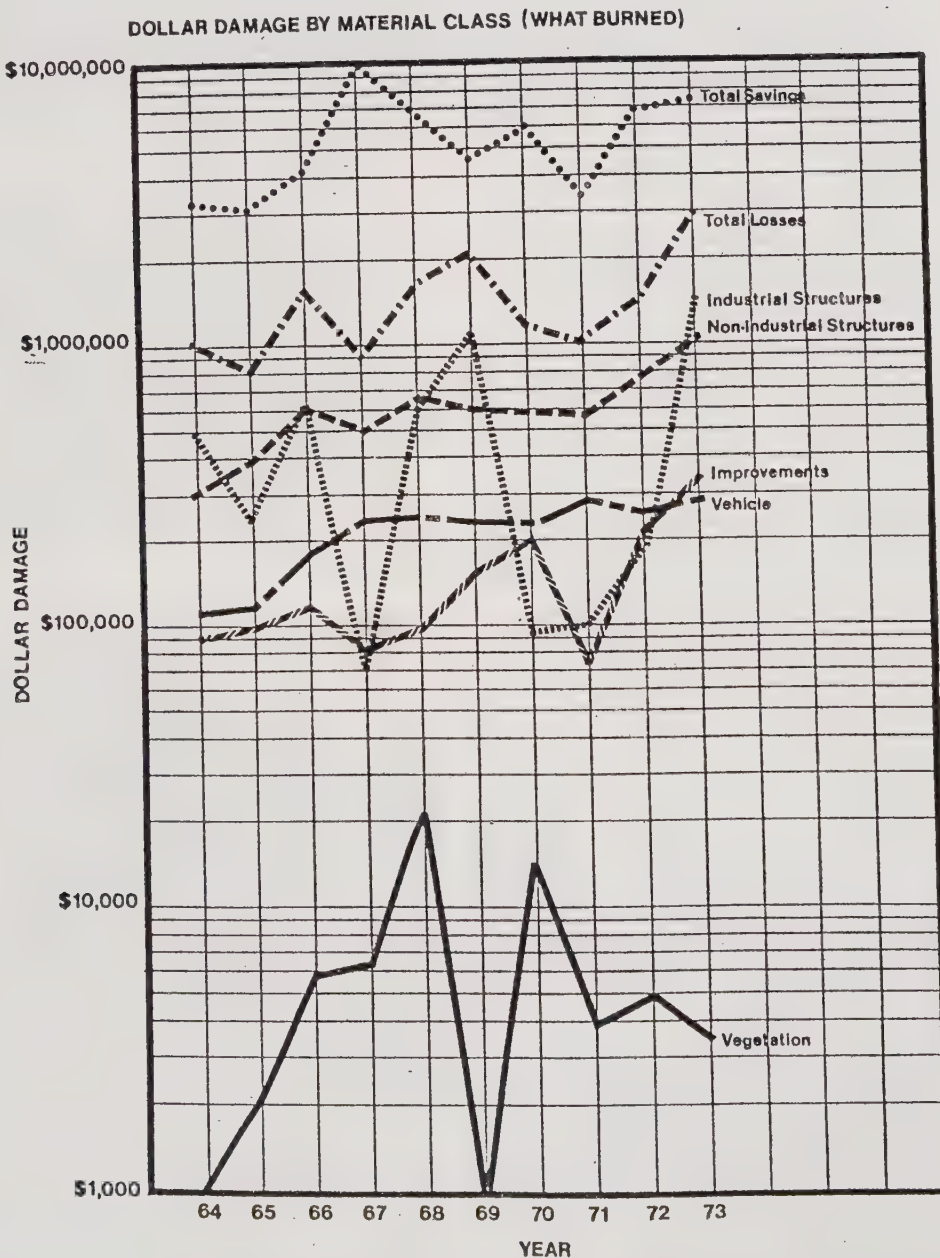
There is little incentive to invest in fire safety. Clients of building designers generally believe that fire is a small risk in the future of their building. Or they judge that potential losses are adequately covered by their insurance policies. For owners of private homes, no incentives exist such as reduced insurance premiums for those who use enlightened designing, flame-resistant materials or those who install smoke and heat detectors, a sprinkler system or other measures that would reduce the fire hazards and risks to life and property.

Perhaps a yearly "Fire Safe" incentive program should be more vigorously pursued by the County Fire Warden.²⁷ A close working relationship between Fire Warden and Planning and Building Departments is necessary for alerting builders to potential hazards where the hazard is apt to show up on construction and site plans.

Mobilehomes - Mobilehomes have enjoyed a fantastic rise in popularity in recent years. Seven million Americans now live in mobilehomes and 500,000 mobilehomes are now being built each year.⁴³ With the cost of standard dwellings increasing much faster than the average person's wages, such homes are fast becoming too expensive for more and more people. Mobilehomes provide the comfort and privacy of standard homes, while usually costing less than half as much. In addition, there are no property taxes on the structure itself.

However, mobilehomes pose special problems which raise the level of risk to occupants and their belongings and which are worth mentioning here.

The relatively small size of mobilehomes results in heaters and kitchens being in close proximity to sleeping areas which could quicken the rate at which fire, toxic fumes and gases in the kitchen would reach occupants when sleeping. Being compact, mobilehomes tend to have a higher concentration of combustible materials.



Source: Tulare County Fire Warden

PREPARED BY TULARE COUNTY PLANNING DEPARTMENT

In many cases, mobilehomes lack an adequate number of escape doors. Many of the rooms (compartments) in mobilehomes have only one door to the hallway, and the entire structure may have only two possible exits in case of an emergency and these would be the doors. Some have only one door. More often than not, the windows are designed in such a way as to be difficult or impossible to use for emergency escapes. Additionally, the interior finish of mobilehomes have a higher combustibility than in most on-site built homes.

And finally, because of zoning requirements, mobilehome parks are frequently located outside of cities and hence, far from fire departments and adequate water supplies. This implies that the parks themselves must provide safeguards against destructive fires. The evidence of the results of increased risks associated with mobilehomes is borne out from data compiled by the State Fire Marshal of Oregon for the years 1965 to 1971. Statistics have shown the following to be true:

The ratio of fatalities per fire in mobilehomes is 2.74 times greater than for standard dwellings;

The loss-to-value ratio per fire in mobilehomes is 3.84 times greater than standard dwellings; and

The average mobilehome fire losses are greater than average losses in standard dwellings by a ratio of 1.62 to 1 (\$1,477 per fire average to \$909 average for standard dwellings).

Code Regulations and Enforcement

There are a multitude of standards dealing with fire hazards, contained within seven codes. They are:

Building Code - Applies principally to new construction and alterations, though it is sometimes made retroactive and applied to existing buildings if past deficiencies are discovered to be critical.

Fire Prevention Code - May govern the maintenance of the building once a building is constructed, and govern the introduction of materials into the building for the sake of fire safety.

Housing Code - Concerned with livability standards for sanitation, health facilities and building maintenance.

Electrical Code - Sets requirements for materials and equipment used in electrical systems.

Plumbing Code - Provides for delivery of potable water and safe disposal of flushed wastes.

Mechanical Code - Applies to heating, ventilating and air conditioning.

Elevator Code - Governs materials, equipment, and installation of elevators and their use.

The first two are the most important from the standpoint of fire safety. Typically, about two-thirds to three-fourths of the provisions of a building code apply to fire safety, as do all the provisions of a fire prevention code.

Presently, the County is covered by the 1973 Uniform Building Code, but not the Uniform Fire Code, 1973 edition, (prepared by the Western Fire Chiefs Association in conjunction with the International Conference of Building Officials). In general, the Uniform Fire Code is to govern the maintenance of buildings and premises; to safeguard life, health, property and public welfare by regulating the storage, use and handling of dangerous and hazardous materials, substances and processes, and by regulating the maintenance of adequate egress facilities." The adoption of the UFC by the County and cities would be an important step in helping to reduce existing fire hazardous conditions and lessen the possibility of major new fire hazards from developing. Moreover, it would enable fire prevention agencies to inspect the interior of buildings which might be fire hazardous. This is especially important where public housing is under the auspices of local government and group quarters are maintained for farm workers.³⁷

A few of the shortcomings of codes were mentioned previously, such as their inability to cover all substances within structures which might prove to be fire hazards. Nevertheless, the Report of the National Commission on Fire Prevention and Control strongly recommends that "all local governmental units in the United States have in force an adequate building code and fire prevention code, or adopt whichever they lack."

The advantages of adopting the UFC greatly outweigh the disadvantages. These would principally involve training and staffing persons to carry out the building inspections program (a public cost) and the cost in having existing and future structures meet fire code requirements (principally a private cost).

The advantages are found in the inevitable reduction in the number of casualties from fires, reduction in property loss and environmental degradation, and the reduction in costs of fire suppression.

In the future, the responsibility for reducing the risks associated with fire must be borne increasingly on the shoulders of the owners of structures, while the public at large must become more aware of fire safety. With the adoption of the Uniform Fire Code as a guide, structures can be better designed and constructed with fire safety in mind, and adequate heat and smoke detectors can be installed. These measures, coupled with an aggressive fire safety public education program, will reduce life, property and environmental risk.

Fire Safety Technology

If structures are to become better protected from fire, then, as pointed out earlier, reliance cannot be based solely upon design, materials and building codes; nor only upon increasing capability of fire protection agencies. There will always be some limitation to these measures. It will be practically impossible to make every building and its contents fireproof; nor is it practical to locate every building within close proximity to a fire station. Consequently, the best alternate solution is to provide structures with heat and smoke detectors to alarm occupants and/or the fire department, and to provide structures with automatic and/or manual fire suppression equipment. The type, location, and capacity of such equipment should be determined from a systems analysis of the problem.

Further studies need to be undertaken in analyzing public expenditures vs. private expenditures of funds for on-site safety; with the objective of the user benefit concept in mind.

Enough is known today about fire safety to permit a reliable application of a sophisticated systems approach to fire safety design.⁶⁸ In the systems approach, objectives are set for the building as a whole, and then the best cost-effective

technology is applied to meet those objectives. Relationships among components are important, and trade-offs are sought. For example, if alarm and sprinkler systems are installed to provide quick and effective response to a fire, then fireproofing requirements for walls and floors may be reduced. Backup measures are provided in case part of the system fails, but redundancy for the sake of redundancy is avoided.

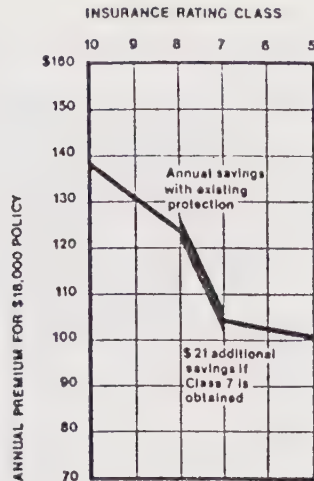
The cost in providing for emergency water supplies, emergency diesel pumps (in case electricity is cut off), and emergency refuge areas, to name just a few, can be somewhat offset by lower cost in preventing a fire from spreading, such as eliminating the need for fire limiting devices from the air conditioning system; and installing a sprinkler system with smaller sized pipes.

"There is presently enough information and a wide range of technological choices (for example, total communications systems, fire retardants, fire resistant coatings) to permit architects, engineers, and other building designers to plan buildings that are safeguarded from fire. What is needed, in many cases, are incentives."⁴³ Examples of possible incentives are: reduced fire insurance premiums; reduced taxes for fire protection from local fire departments if requirements are met, and more efficient, safe building design. Particularly in those areas of the County where high value industrial sites have inadequate access to public fire services. (see map titled "Major Industrial Facilities")

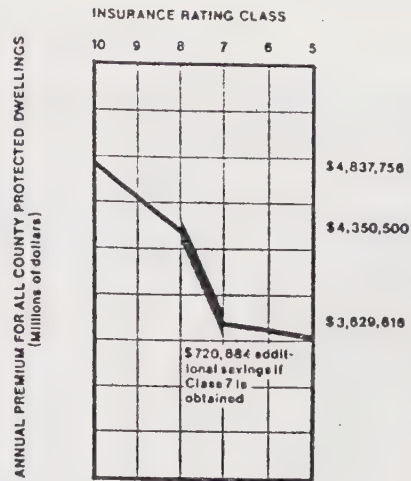
What are other Counties doing? In a survey of California counties, undertaken during preparation of the Safety Element, the Planning Department staff found that 83% of California counties were either considering adoption of the Uniform Fire Code or had already adopted the UFC. Of the counties responding, 17% indicated that they did not intend to adopt the Uniform Fire Code at that time (summer-1974).

FIRE INSURANCE SAVINGS AS RELATED TO FIRE PROTECTION

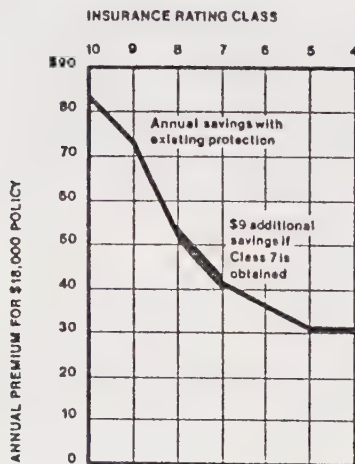
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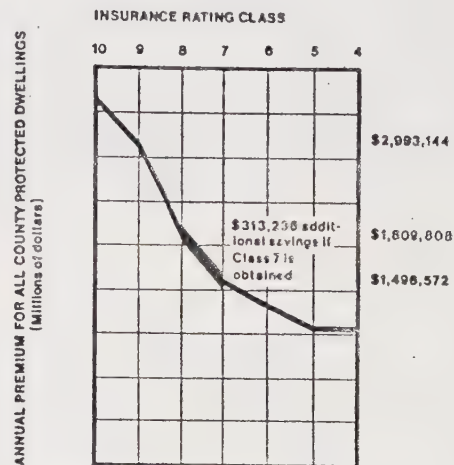
ITEM 1: HOME OWNERS' INSURANCE
(Individual savings)



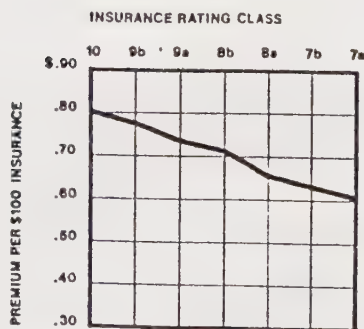
ITEM 2: HOME OWNERS' INSURANCE
(Countywide savings)



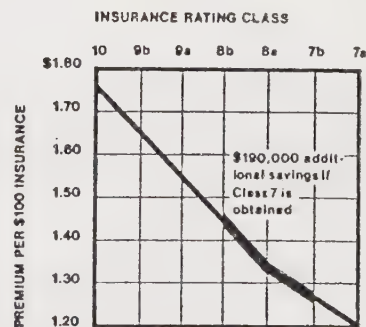
ITEM 3: "STRAIGHT" FIRE INSURANCE
(Often used for rental units)



ITEM 4: "STRAIGHT" FIRE INSURANCE
(Often used for rental units)



ITEM 5: "KEY RATE" FOR FIRE RESISTANT CONSTRUCTION



ITEM 6: "KEY RATE" FOR FRAME CONSTRUCTION

Source: Tulare County Fire Warden

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The top items (item #1 through 4) show individual and total County protected area savings estimated in 1972. The Insurance Services Office in San Francisco interprets criteria by which rates are usually quoted by insurance companies. (Mutual companies are not bound by ISO recommendations.) Insurance rates and criteria are continually changing but the total savings can, to a great degree, offset fire protection costs and auxiliary services provided by the fire department, including light rescue capabilities.

In order to keep insurance rates down, ISO criteria are considered in the recommendations of the County Fire Warden when responding to special use permits, subdivisions and building permits. They include:

1. Adequacy of water

2. Distance from a fire station
3. Communication systems
4. Safety controls (construction adequacy, codes and code enforcement)

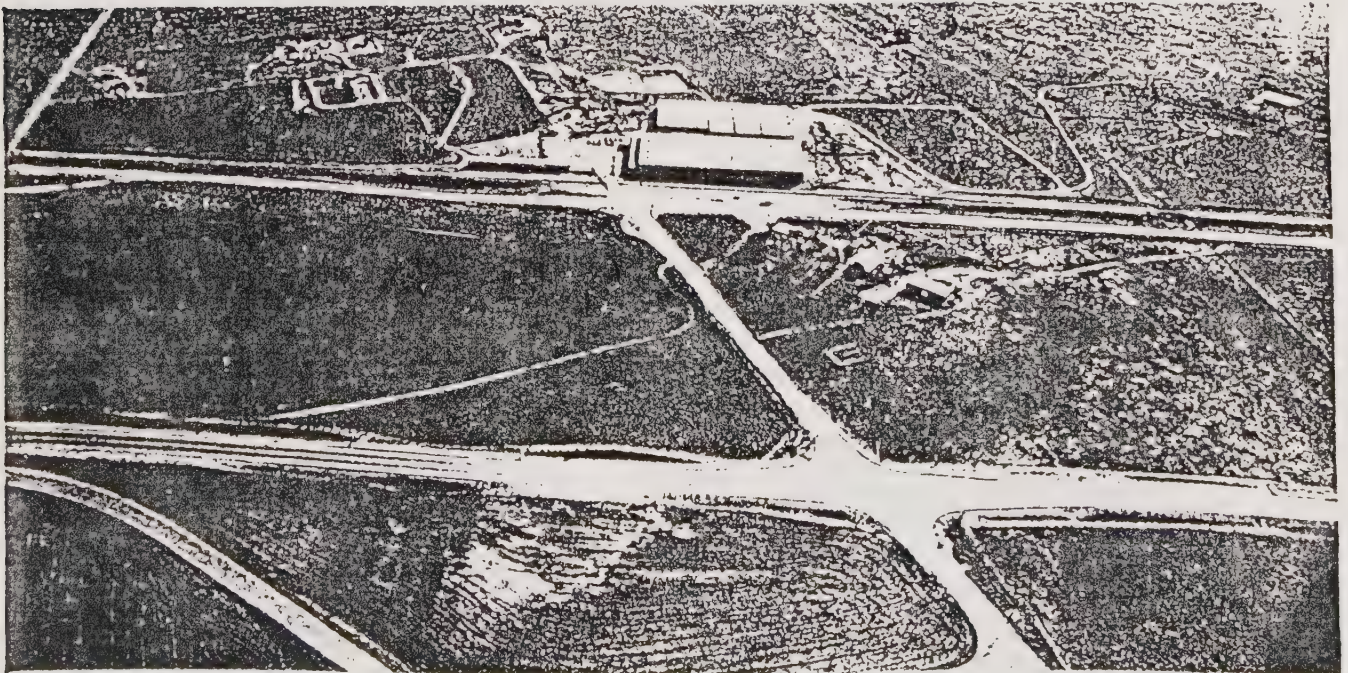
Industrial structures are classified in a more complex procedure (called the "key rate") and are not included within the rate structure for residences (items 5 & 6). The key rate is the beginning rate and factors are included for occupancy with lumber yards and packing houses, however, the insurance cost is immediately raised by 300% -- then the occupancy factor is considered.

Data for 1972

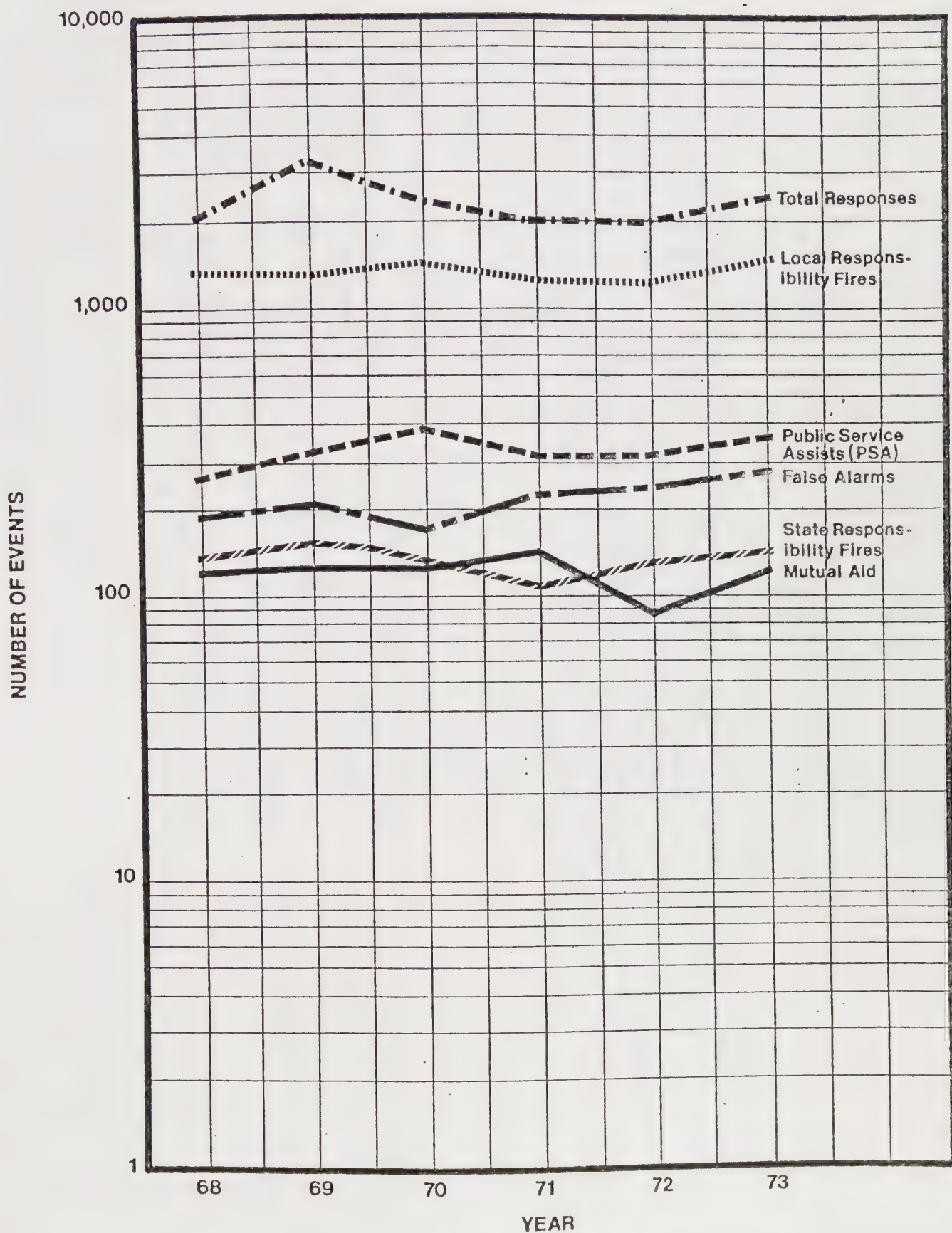


A packing house and cold storage unit located in an agricultural area provides needed services to farmers and truckers. These types of industry are often located far enough from

emergency services that they must provide their own fire suppression and detection devices to protect their employees and facilities



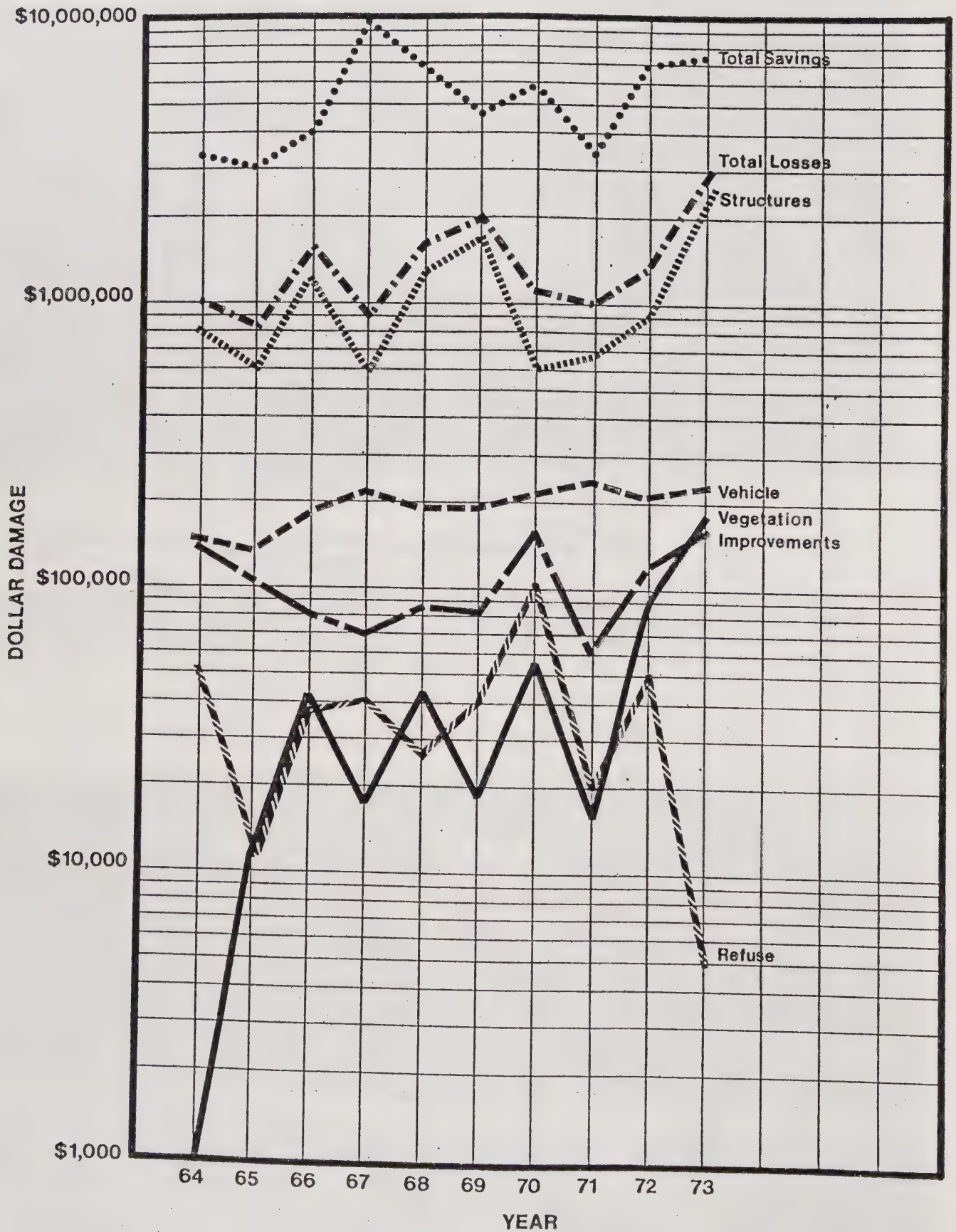
STATE vs. LOCAL RESPONSIBILITY AREA RESPONSES



Source: Tulare County Fire Warden

PREPARED BY TULARE COUNTY PLANNING DEPARTMENT

DOLLAR DAMAGE BY ORIGIN CLASS (WHERE THE FIRE STARTED)



Source: Tulare County Fire Warden

PREPARED BY TULARE COUNTY PLANNING DEPARTMENT



Fuel storage depots and chemical storage in large quantities are not only dangerous to firemen but to other citizens as well. This fire started near a gasoline storage depot and is quickly spreading out of control. Water alone may not control these kinds of fires. Furthermore, these fires represent a significant danger to firemen themselves. Explosion and fires as well as smoke and toxic materials may kill fire fighters or bystanders before

flames even reach them. Tulare County is an agricultural county and the necessity for these kinds of facilities is evident if one looks at the nature of the economy of the County as a whole. It is often through the environmental impact assessment process that mitigation measures to prevent such hazards can be obtained. Subdivision and zoning procedures also help to mitigate the potential impact of these kinds of fires and hazards.

SAFETY-CRITICAL FACILITIES

Critical facilities include law enforcement facilities, communication facilities, principle routes of assistance, and other facilities as listed on the adjacent map. These were considered to be critical in terms of their ability to not only provide service, but to provide it at time of disaster or need insofar as the overall community is concerned. In this regard each facility cannot be looked at individually. The entire system must be looked at as a functioning whole that needs to be satisfied in all its parts. For example, if there were a major flood in one portion of the County, fire facilities and law enforcement facilities would be utilized from other parts of the County. This would put a burden upon the remaining communities needing services at the same time. The pattern of critical facilities is scattered and tends to be related to the location of the communities themselves. Exceptions to this are water and sewer facilities where it is not necessary to locate within the community.

Seismic safety risk zones are shown as developed in the Five County Seismic Safety Element. Critical facilities would be needed in times of disaster. Geologic factors, distance from major earthquake faults, soil depth, water level, and other factors were included in the analysis of the zones and the establishment of the zone boundaries.

Highways and railroads are also considered to be critical facilities and are shown on the map.

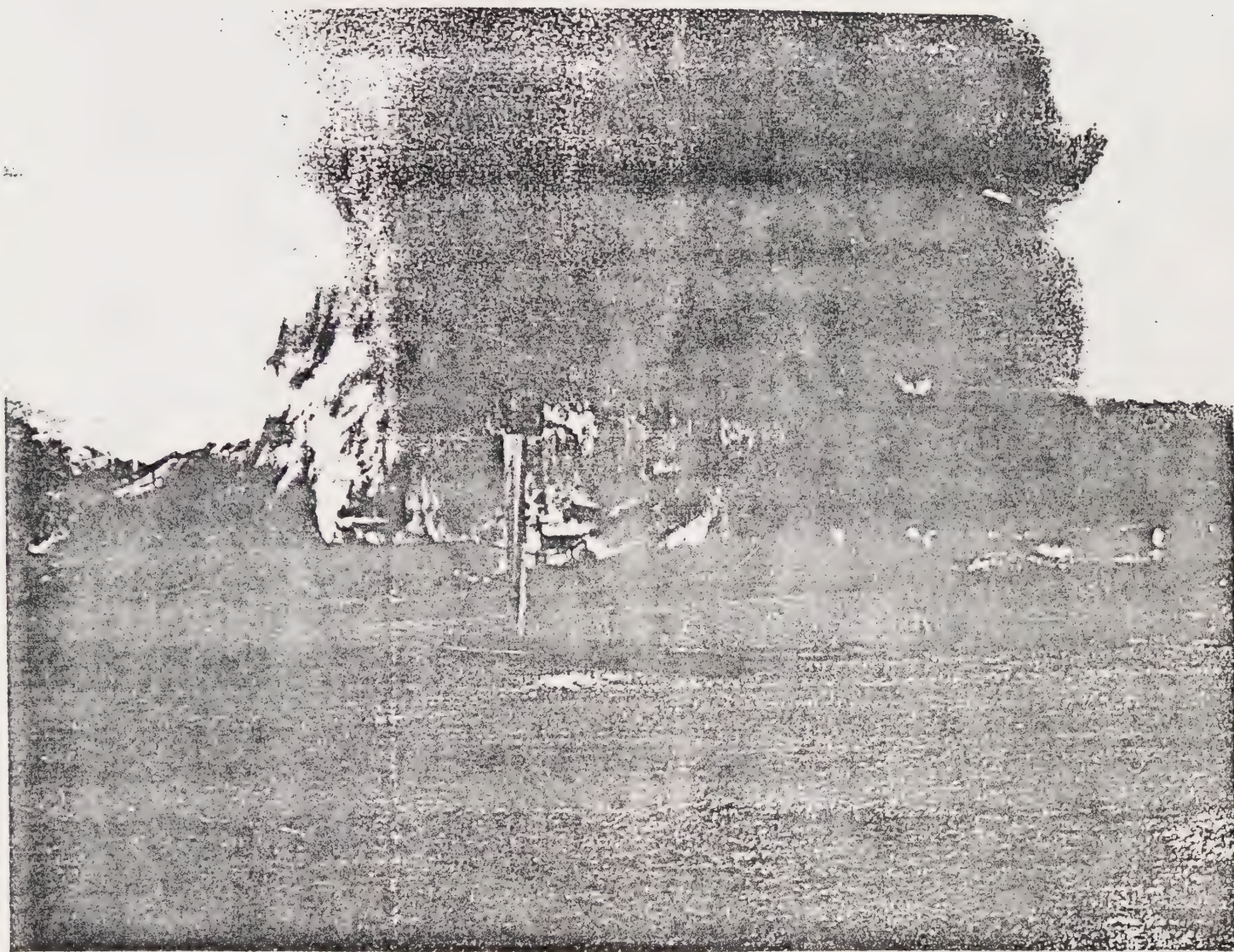
The replacement of some facilities due to seismic safety standards, as recommended in the Seismic Safety Element, is suggested. In the case of fire stations several are antiquated and subject to seismic safety hazards as well as structural hazards. Where this is the case they should be removed.

MAJOR INDUSTRIAL FACILITIES -
INITIAL ATTACK ZONES

Industrial facilities are shown on the adjacent map in conjunction with Urban Area Boundaries around the incorporated cities and in conjunction with the initial fire attack zones as described by the individual fire captains of stations within the County. A survey was undertaken to determine their ability to respond in a given area within approximately 5 miles or 5 minutes.

Additional correlations can be made by looking at these initial fire attack zones in relation to population, overall assessed evaluation (industrial facilities) and the location of critical facilities such as schools and hospitals. It can be seen from this map that there are numerous major industrial sites throughout the County that are not adequately covered by service (under the assumption that 5 miles or 5 minutes is adequate service). In many cases these are agriculture related industries, that of necessity, must be located in zones where fire service is not the best. For example packing houses would be a type of industrial facility found in these areas. Danger is not so great from these facilities since they are only used for a few months of the year, however, most of them are made of wood and are highly flammable. In addition they do employ large numbers of people in many cases. Further consideration to location of industrial sites throughout the County, on the part of the Planning Commission, should be based partly on the ability of the fire warden to respond to major fires when required.

Another comparative analysis that can be made from this map is with the initial fire attack zones. The initial fire attack zones give an indication of the extent of the area under the jurisdiction of that particular fire captain and that station. The additional duties of each one of these individuals in the field is often greater than the maps might indicate. This is particularly true in the urbanizing areas where weed abatement programs and issuance of burning permits, etc. are a necessary function of the fire warden. 4, 47



This fire occurred in an industrial zone and created havoc with the rail transportation facilities adjacent. On occasion transportation facilities themselves are the hazard. In transporting of large quantities of fuel and

chemicals to an agricultural county such as Tulare there is no warning to local governments that these kinds of materials are passing through the County.

CHAPTER V

Fire Safety and People

Probably the greatest danger to life from fire is the widespread lack of knowledge about the nature and causes of fire, and what to do in case of a fire. There are many instances where people have needlessly died in fires because of not knowing how to react when a fire occurs.

Most people believe that flames are the chief threat to life. Actually, flames are the least cause of death from a fire. There are five ways in which fire can kill; they are arranged in declining order of importance as follows:⁴³

Asphyxiation (lack of oxygen) - This is the chief cause of death in fires. Under normal conditions at sea level the air contains about 20% oxygen, the atmospheric element vital for life. Since fires consume the oxygen in the air, the percentage of oxygen is reduced in the vicinity of the fire. This reduction of oxygen has an adverse effect upon people.

When the level of oxygen is below 17% thinking becomes an effort, coordination is difficult; below 16% attempts to escape fire may be ineffective or irrational, wasting vital seconds; as the level of oxygen goes lower and lower, a person loses muscular coordination for skilled movements, and muscular effort leads to fatigue; and, below 6% breathing ceases. At normal temperatures a person would be dead within six to eight minutes.



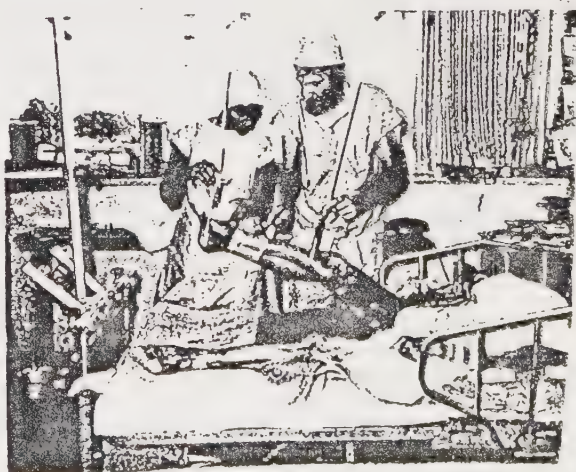
These photographs were taken at the Valley Regional Burn Center in Fresno, a specialized hospital for the treatment of people who have been injured by fire. Smaller communities cannot afford these special facilities and services. The time it takes to transport the

Attack by superheated air or gases - When the air temperature raises above 300°F. loss of consciousness or death can occur within several minutes. Hot smoke with a high moisture content is a special danger since it destroys tissues deep in the lungs by burning.

Smoke - Smoke inhalation, or products of incomplete combustion kills people who suffer no skin burns at all. Most deaths, in fact, in residential fires, are from smoke inhalation, according to the Report of the National Commission on Fire Prevention and Control. Smoke carries such toxic products as carbon monoxide, hydrogen cyanide, plus such organic irritants as acetic acid and formaldehyde. Irritants, which in the early stages of fire attack the mucous membranes of the respiratory tract, are often the more important danger. Smoke often blocks the visibility of exits, thus hindering escape.

Toxic products - Oxides of nitrogen, aldehydes, hydrogen cyanide, sulfur dioxide, and ammonia are just a few of the toxic products which result from combustion. Some irritants have a blinding effect on the eyes, or dull the senses to danger.

Low oxygen and high temperatures increase the toxic effect. Moreover, the sum of two or more toxic products have a cumulative effect greater than the sum of both.



patients who have been badly burned in fires to a specialized facility such as this may often cost them their lives. These people have been badly burned in a fire and are being treated by personnel at the burn center located in Fresno.

Fire - The size, location and severity of burns largely determine the chances for survival of persons injured in a fire. Progress has been made in increasing the chances for survival through improved techniques for treating burns, and through the establishment of special burn treatment centers, such as the one in Fresno, California.

In Appendix B there is a list of measures that citizens can take to reduce fire hazards in their own home and place of work. Another list informs people of what to do if and when a fire should occur. An understanding of, and adherence to these measures would undoubtedly result in fewer fires and fewer lives lost or injured in the event of a fire.

In the preceding sections dealing with fire hazards through design and use of materials, some mention was made of personal risks incurred because of hazardous conditions. Examples cited included: designing staircases too small to serve as adequate emergency escape routes for the building's occupants; designing windows that would be difficult to escape through, if the need should arise; and using highly flammable materials, or materials which produce noxious gases and smoke.

Persons living in rural, sparsely populated areas of the County face even greater risk to themselves and their property. If a fire should occur at night when the occupants are sleeping, there is less chance that a passerby or neighbor would notice the fire and wake the occupants. Many deaths, as noted previously, are caused not by flames, but by asphyxiation, toxic products, hot gases and smoke. A person may be killed or seriously injured even without having awakened and noticed the fire. Even should the alarm be given to the fire department, the response time of the fire fighters to the blaze is generally lower, due to the lower density of fire stations per area served than in cities. Additionally, adequate water for fire suppression is not always available. If the dwelling has a large supply of water such as a tank, sump, high pressure pump, or even a swimming pool, then the chances of extinguishing the blaze sooner and saving the structure, and possibly the lives of its occupants, are greatly enhanced. (At present, the California Division of Forestry operates several tankers dispersed around the valley portion of the County.)

"Because many volunteer departments keep scanty records or no records at all, the seriousness of the fire problem outside of metropolitan areas is difficult to gauge. According to the Department of Health, Education, and Welfare, the fire fatality rate for white Americans in non-metropolitan areas is half again as great as the rate for whites in Metropolitan counties (4 per 100,000 vs. 2.7 per 100,000). Among non-whites, the disparity is even greater: 15.3 per 100,000 in non-metropolitan counties, 8.1 per 100,000 in metropolitan counties. In New Hampshire, where 56% of the land is classified as urban, 29 out of the 32 deaths from fire in 1971 occurred in rural areas. Fire officials in New Hampshire estimate that if all rural homes had early warning detectors, rural fire deaths would decline by as much as 75%."43

Indeed, statistics show that most deaths occur at night during sleeping hours, in both rural and urban areas and in large part are related to substandard dwellings. The City of Visalia has attempted to bring standard structures up to code requirements and remove from the city some of the extremely poor structures, thus it is felt that a reduction in fire hazard has resulted. The alarm given to occupants by early-warning detectors might just give them the extra few minutes to awaken and escape the fire. "But what is especially critical for rural dwellers is that if they awake belatedly and are trapped, it may be many minutes before the fire department arrives to rescue them"

It is for these reasons that the National Commission on Fire Prevention and Control recommends with special urgency that rural dwellers and others living at a distance from fire departments install early warning detectors and alarms to protect people while sleeping.

Fire hazards also vary depending upon the kind of persons occupying the structure. Hospitals, nursery schools and day care centers, and homes for the elderly, the physically and mentally infirm are of special concern because of the limited capacities of its occupants. The manner in which such persons respond to a fire would be expected to be different from others. Hence, greater safety must be afforded such occupants through incorporation of special structural design features, use of more fire retardant materials, and installation of better and more sophisticated detection and suppression equipment than would ordinarily be expected.

Design features might include: using ramps rather than steps; using low-rise, rather than high-rise construction; designing wider internal hallways; or better still, having more rooms open directly to the outside, thereby increasing the number of possible evacuation routes in the event of a fire, or other disaster.

Use of more fire-resistant and fireproof materials in the structure, e.g., walls, ceilings, floors and doors, and in the furnishings, e.g., carpeting, desks, draperies, beds and blankets, would help reduce the fire hazards.

Detection and suppression might be installed more extensively, such as in the sleeping areas, classrooms and hallways, and designed to notify the fire department directly in the event of a fire. At present, some of these special facilities are so equipped, such as hospitals, schools, and new public facilities, but others such as day care centers, nursery schools and older structures are not. The Uniform Fire Code, 1973 Edition, if adopted, would be significantly helpful in providing greater public safety for such structures not presently covered by the building code alone.

Clothing, too, can present a fire hazard. Some clothing styles and materials are more dangerous to its wearers than others. In general, synthetic materials are more flammable than cotton and wool, and loose fitting clothes with lots of material are more likely to catch on fire (and more difficult to extinguish) than clothes that are trim and close fitting.

Jurisdiction for testing and establishing flammability standards rests with the State and Federal governments. Nevertheless, the risks to life are still worth mentioning here. In those institutions that are operated by the County, cities, and special districts within the County where clothing is supplied by the institution, the directors have an opportunity to specify flame-resistant clothing for persons under their responsibility, thereby reducing the level of risk to the occupants and personnel.

In conclusion, there is much that can be done to reduce the level of personal risk, both through fire prevention, and should a fire occur, in reducing the risk of injury and loss of life. However, it will take the efforts of government at every level, institutions and citizens to bring about a reduction in risk levels, and consequently a reduction in the very real costs of providing fire suppression services.

It is recommended that the Tulare County Fire Warden and City Fire Chiefs continue and increase their efforts towards inducing the public to reduce risk. Fire departments should recognize the need to concentrate on areas within Urban Area Boundaries in order to provide the highest level of service possible to the population wishing to have urban services in those areas. As the County and cities are able to reduce the possibilities of conflagration due to fire as a combination of fire, flood and seismic disasters, then the objectives of the Insurance Services Office can be more adequately met and eventual reduction in the cost of insurance premiums may result.

Bystanders

The risks to people during a fire is by no means limited just to the occupants. Blazes that occur, especially in urban areas, tend to attract crowds of onlookers. These people are not only risking their own lives, they are also hampering the efforts of fire officials in fighting the blaze.

Bystanders, if not kept back far enough by police, face the danger from possible explosions of fuel or chemicals, falling debris, collapsing walls, and from fire department trucks and other firefighting equipment.

By hampering the efforts of firefighters in possible rescue operations of occupants and in suppression of the fire, the risks to life and property can be greatly increased, rather than reduced. Furnishing the fire department with the latest and best equipment will not result in a decrease in the level of risk to life and property, if such equipment is delayed in being put to use in firefighting by having to struggle through crowds of onlookers.

Police are often first to arrive at the scene of a fire or disaster, particularly in urban areas, because they operate from mobile positions and may already be in the vicinity of a fire when they are dispatched. Being first on the scene, they can notify and help evacuate occupants, shut off gas mains, and control crowds before the fire trucks arrive. By keeping the area clear for firefighters, i.e., keeping crowds back and rerouting traffic, the police play an important role in the firefighting and disaster situations of all kinds.

It is recommended that the police and fire departments periodically conduct joint training exercises with the goal of developing the best possible coordinated action in fire suppression and crowd control.

It is recommended that the Tulare County Office of Emergency Services maintain inventories of available resources to be used during disasters.

Only through continued upgrading of disaster preparedness strategies and techniques can all levels of government be prepared when disaster, either natural or man made occurs.

Fire Control Limitations & Possibilities

There are a number of fire control limitations which any fire control agency is faced with. The more important ones are: (a) detection of the fire; (b) mobilization of forces; (c) distance, time and route of suppression forces to the fire; (d) availability of water near site for fire suppression; (e) special hazards of the blaze itself; and; (f) communication system among various safety agencies (police, fire, ambulance, etc.) that must coordinate their actions in order to reduce the risks to life, property and the environment. These factors will each be discussed more fully in turn below.

Detection of the Fire

This is perhaps one of the most overlooked factors in fire prevention and control. Many lives are lost, much property is destroyed, and many acres of wildland have burned needlessly because fires were not detected as soon as they could have been if heat and smoke detectors had been installed. As previously discussed in other sections of this report, and emphasized here again: the value of such detectors are of inestimable value, particularly in rural areas, in reducing the risks to life, property and the environment.

It is recommended that the County and cities adopt a policy of promoting/encouraging the installation of heat and smoke detectors (particularly in structures located in outlying areas); providing tax incentives or other measures to ease the financial burden of installation costs.

Oftentimes, the first few minutes of a fire (particularly structural and vehicle) determine whether or not the risks to life and property will be great.

Mobilization of Forces and Volunteers

All fires reported to the Division of Forestry are received at the District Headquarters near Visalia. The headquarters in turn notifies the fire station of stations which must respond. Once the fire department has been notified of the location of a fire, it must quickly determine if the fire is to a residence, or to a commercial or industrial structure which might require response from more than one fire station. Additionally, in rural and semi-rural areas the fire department must notify volunteers so that they can respond to the fire. Some will be needed to man additional trucks and equipment necessary to fight the fire.

In many locales sirens are used to notify volunteers. However, radio controlled pagers have been proven to be a significant improvement over sirens, resulting in a quicker volunteer response.

Using pagers could mean additional reduction in the risks to life and property. The essential problem faced by the Fire Department is one of increasing effectiveness of volunteers in order to extend departmental capabilities and thereby further reduce risk of life and property.

It is recommended that the County provide necessary funds to the California Division of Forestry and other fire departments in order to purchase additional pagers.

Distance, Time and Route of Suppression Forces to Fire

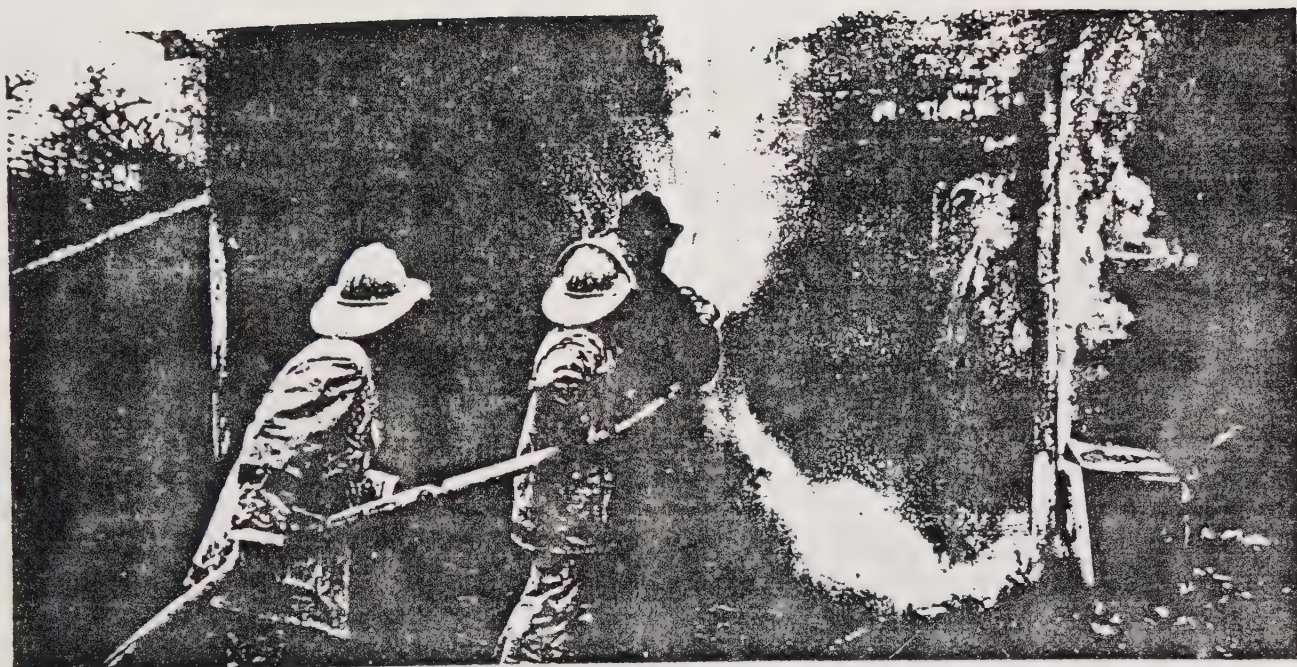
The quicker the fire department can reach a fire, the better the chance that lives will be saved, loss to property will be minimized and wildland fires be controlled. The valley portion of the County is crisscrossed with roads, and the time for a fire truck to reach the scene of a fire or emergency is generally dependent upon the distance of the fire or emergency from the station. Barriers which would increase the response time by requiring the fire trucks to take a more circuitous route in the valley include: rivers, streams, canals, freeways, railroad tracks, large blocks of land with few roads, etc.

In the mountainous portions of the County the initial response to a wildland fire would most likely be an aerial tanker. During the fire season from late May to October, planes with a 800 to 2,000 gallon retardant capacity are stationed at the Porterville airports to primarily serve the southern Sierras. (Similar aerial tankers in Fresno serve the central Sierras.)



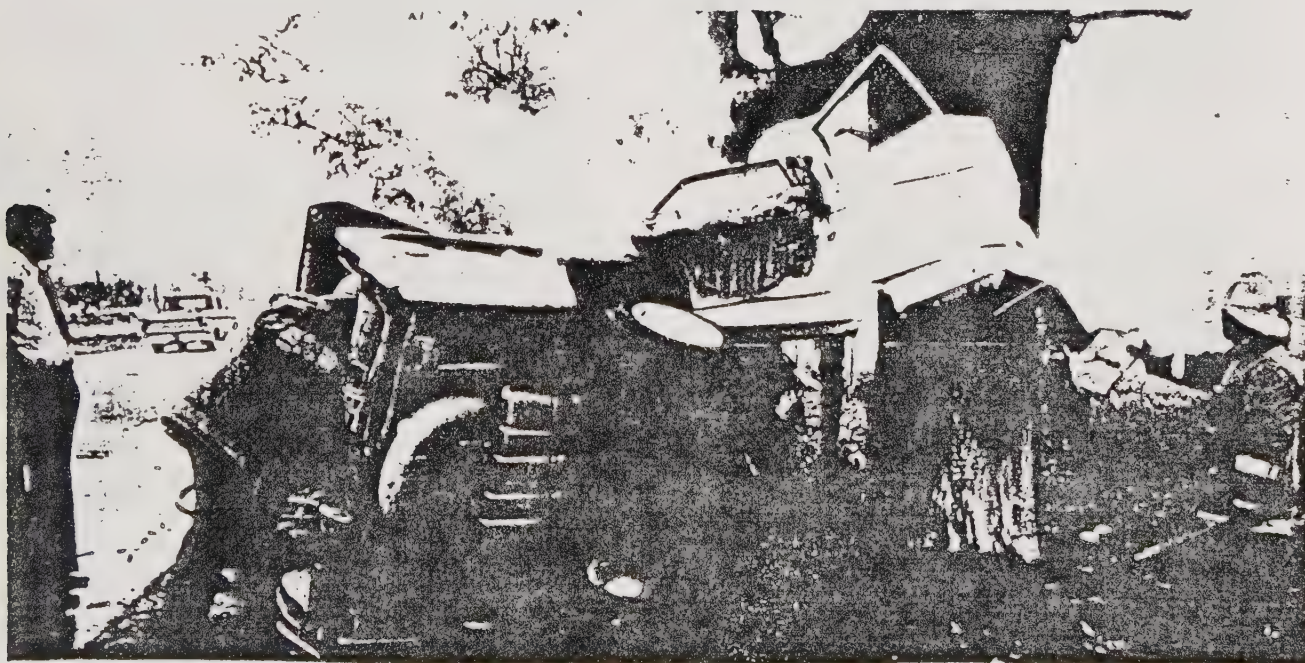
Often it is necessary to remove unsafe and unsanitary housing in older portions of the communities in Tulare County. Visalia's "workable procedures" provide a means whereby fire fighters can obtain valuable experience in fighting fires while at the same time removing structures that have been declared unsound and not fit for human use. In the photo-

graph above, fire equipment and procedures are being tested to determine their applicability in case of disaster. Note the close proximity of the adjacent house which is of good quality. Dilapidated structures with poor electrical systems increase risks to adjacent property owners.



Fire fighters are attacking a house that has caught on fire. It is almost impossible to save a house such as this where the fire has

completely engulfed the structure. Smoke, water and fumes alone would destroy the structure if the fire had not done so.



This photograph is typical of the kinds of public assist calls that the fire department is requested to make. In this case, the County Fire Board has responded to a highway acci-

dent and the injured individuals must be extracted from the debris and crushed metal. Specialized kinds of heavy rescue equipment are needed here in this kind of accident.

Grassland fires in the lower foothills may be initially attached by a Division of Forestry or a county fire station located in the valley or lower foothills such as Woodlake, Lemon Cove, Exeter or Springville, to name a few.

In addition to the barriers mentioned above, the fire fighters may be faced with hilly terrain where only four wheel drive vehicles or bulldozers can operate. (The effect of slope upon fires has been discussed under the category of wildland fire hazards.) Soils may be an impediment to fire trucks in both valley and mountainous terrain. In the valley, trucks can become mired in mud, sand, and alkali soils especially if the soil is water saturated. Coarse soils in the foothills and mountains may impede the movement of fire trucks. Large thick woodland or forest vegetation can act as a barrier in reaching a fire.

Finally, people themselves can be a barrier to reaching a fire. In urban areas crowds are almost always drawn to a fire. Their cars and bicycles further impede the efforts of firemen in setting up their equipment, etc. (See Section titled Personal Hazards Bystanders.)

Availability of Water for Fire Suppression

In areas where a water system is available, the amount of water that can be applied to a fire is dependent upon the size of the water main and fire hydrants and the water pressure as well as the condition of the system itself. For any given pressure, the volume of water varies directly with the diameter of the outlet on the hydrant. Likewise, for any given outlet size, the volume of water varies directly with the residual water pressure in the system.

As defined by the "Improvement Standards of Tulare County, Revised Jan. 16, 1973, and adopted as County Ordinance Code Section 7080,³⁸ fire protection standards for valley subdivisions and mobilehome parks are the same except that water mains shall have a minimum diameter of 6" and fire hydrants shall be a 6" hydrant with one 4-1/2" and one 2-1/2" outlet. For individual commercial structures and other types of developments one or several fire hydrants may be required, depending upon the potential fire hazard as determined by the County Fire Warden. The Fire Warden may require developments in fire hazardous areas to include additional hydrants, access, etc. Structures in which flammable materials are processed or stored may also require additional hydrants.

Standards for providing fire service are included in the Zoning Ordinance, subdivision procedure and engineering requirements.

The type of hydrants required depend on the capacity of the water system. Mountain subdivision must meet the following fire protection standards with respect to water supply, as outlined in the Improve - ment Standards for Tulare County:³⁸

(1) Fire service hydrants shall be placed at the location recommended by the County fire department.

(2) The fire hydrant shall be placed within the right of way of the road and shall not be located further than 660' apart.

(3) The hydrant outlets shall not be less than 2-1/2" in diameter with National Standard threads. Hydrants shall have a minimum flow of 500 gallons per minute (gpm).

(4) Water systems shall be designed to provide a loop system to maintain adequate pressure for fire protection. Dead end or stub lines for cul-de-sacs shall not exceed 660 feet.

(5) The minimum diameter of street water mains shall be 4" for loop systems. Any stub line over 660 feet in length or supporting more than one fire hydrant shall have a minimum diameter of 6".

(6) A 4" waterway from the street main shall be provided to the hydrant outlet.

(7) Water source facilities should have the capacity to support the required flow for a minimum duration of two hours in addition to the maximum daily flow requirements for other consumptive uses. Water storage may be required to assure the required minimum duration fire flow of two hours with the singlemost serious interruption to power lines, water mains and to pump units.

A list of other sources of water for fire suppression could include one or more of the following: on-site water storage tanks, irrigation well, river, canal, reservoir, and even a swimming pool.

Rural industries would be wise to provide their own water supply. Residents in rural or wildland areas having a swimming pool should consider obtaining an emergency pump for utilizing pool water for fire suppression, should the need ever arise.⁴³

Special Hazards of the Blaze Itself

Structures containing flammable or explosive chemicals could greatly hinder the suppression of a fire, and fire personnel would have to be extremely cautious. If the presence of such dangerous materials were unknown to the firefighters, then the risks to their lives could be much greater. The Uniform Fire Code, if adopted by the Board of Supervisors, would require the labeling of structures where toxic and flammable materials are stored.⁵⁷

Presently, there are few structures in the County high enough as to require the use of ladders more than 24 feet* in height. An exception is the Sierra Academy School near Exeter. Nevertheless, the possibility exists of a fire occurring in either an existing or future tall structure, in which case additional automatic detection and suppression devices should be installed within the building to reduce the level of risks to occupants and to fire fighters who would otherwise have to take unnecessary risks to suppress the fire.

Communication Systems

It is necessary to coordinate the actions of various safety agencies (fire, police, ambulance, etc) in order to provide additional suppression forces, have police maintain order and use ambulances to take the injured to hospitals. In wildland

*Within cities, higher ladder capability is maintained.

fires, communications are of particular importance in coordinating the activities of perhaps hundreds of fire fighters spread over wide areas of rugged terrain, reconnaissance aircraft, aerial retardant bombers and firefighting command posts.

When a fire occurs and fire trucks are called away from a station, additional fire trucks from adjacent or nearby stations are sent to provide fire protection for the stations left undermanned. Communication systems play an indispensable role in allocating the resources to provide adequate protection to the residents of the County.

The County Office of Emergency Services and Sheriff's Office are presently installing more sophisticated communication systems to service the County.⁴⁶ Utilization of the 911 emergency call procedure is being implemented. Relay stations are established on firm bedrock (granitic base in the Sierras) in order to avoid seismic risk.

It is recommended that the County and cities, in conjunction with their respective police and fire departments, continually assess their fire suppression capabilities with the aim of lessening the risks to life, property and the environment by taking the necessary measures to reduce fire control limitations.



This Edison facility is typical of the kinds of critical facilities that are called out in the Seismic Safety and Safety Elements. These facilities have to stand and function during and after an earthquake and they should not be subject to fire hazard. This particular

facility is located in the mountain region of Tulare County. Some clearance of the vegetation around the structure is evident but an intense fire could easily damage the facility and prevent service.

**MAJOR INDUSTRIAL FACILITIES-
INITIAL FIRE ATTACK ZONES**

TULARE COUNTY

LEGEND

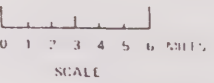
- INDUSTRIAL FACILITIES
- URBAN AREA BOUNDARIES OF INCORPORATED CITIES
- INITIAL FIRE ATTACK ZONES (SEVERAL TYPES)

Note: For description of initial attack zones and fire service responsibility areas, see map titled Fire Service Responsibility

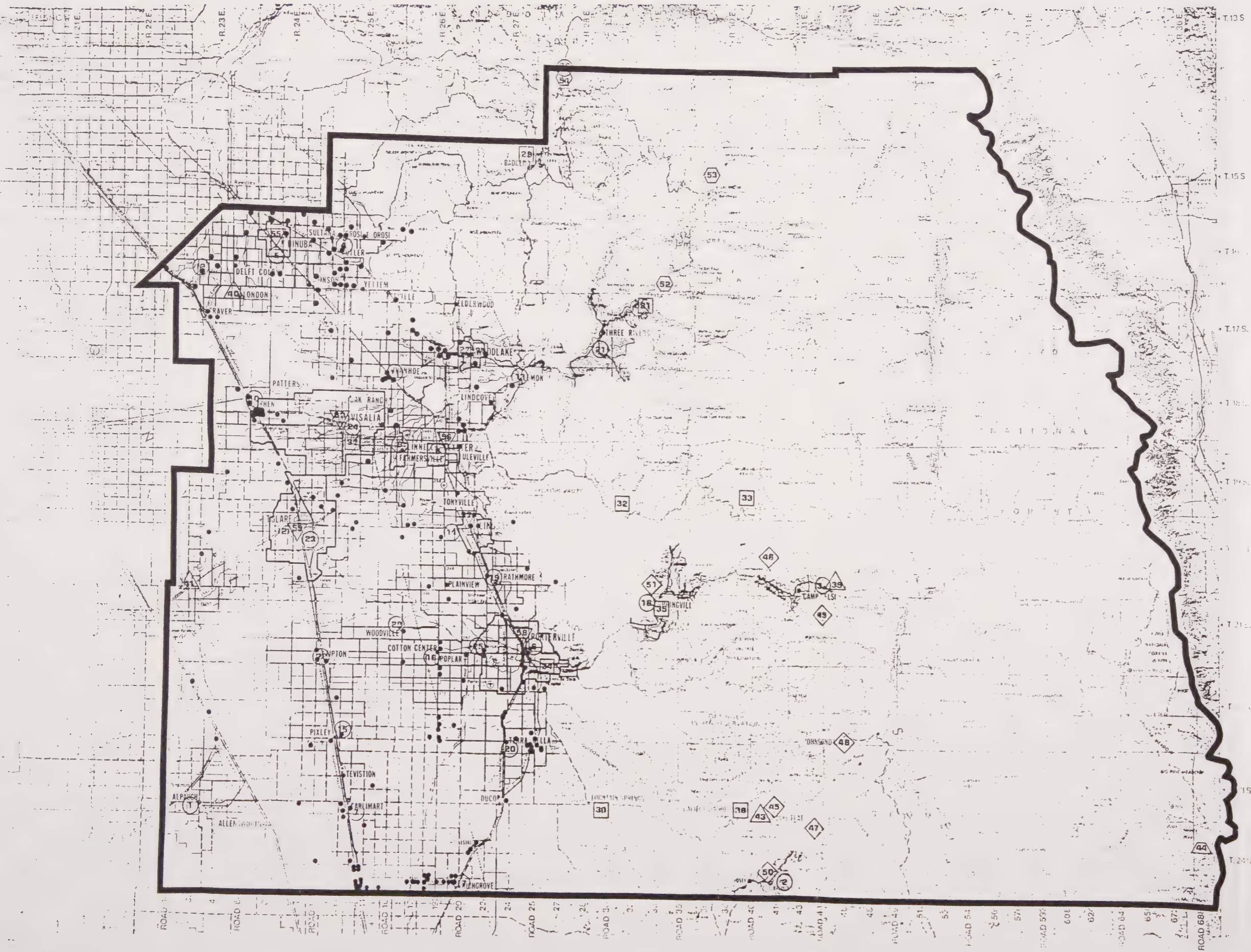
Numbered symbols indicate fire stations. For detailed reference see map titled Fire Services Responsibility

Sources: Tulare County Fire Warden
California Division of Forestry

November 1974



PREPARED BY TULARE COUNTY PLANNING DEPARTMENT



SAFETY-CRITICAL FACILITIES

TULARE COUNTY

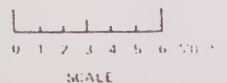
LEGEND

- FIRE STATIONS
- ☆ LAW ENFORCEMENT FACILITY (COUNTY)
- ⚡ COMMUNICATION FACILITY
- PRINCIPAL ROUTES OF ASSISTANCE
- FRIANT-KERN CANAL
- ▢ SCHOOLS
- ✈ AIRPORTS
- ⊙ SEWER FACILITY
- WATER FACILITY
- ⚡ ELECTRIC SUB-STATION
- DAM
- ⚡ HOSPITAL
- ♦ EMERGENCY SHELTER
- ▲ AMBULANCE
- OTHER PUBLIC AND PRIVATE COMMUNITY FACILITIES (IDENTIFIED IN CRITICAL FACILITY LISTING)
- EVACUATION ROUTES
- SEISMIC SAFETY RISK ZONES

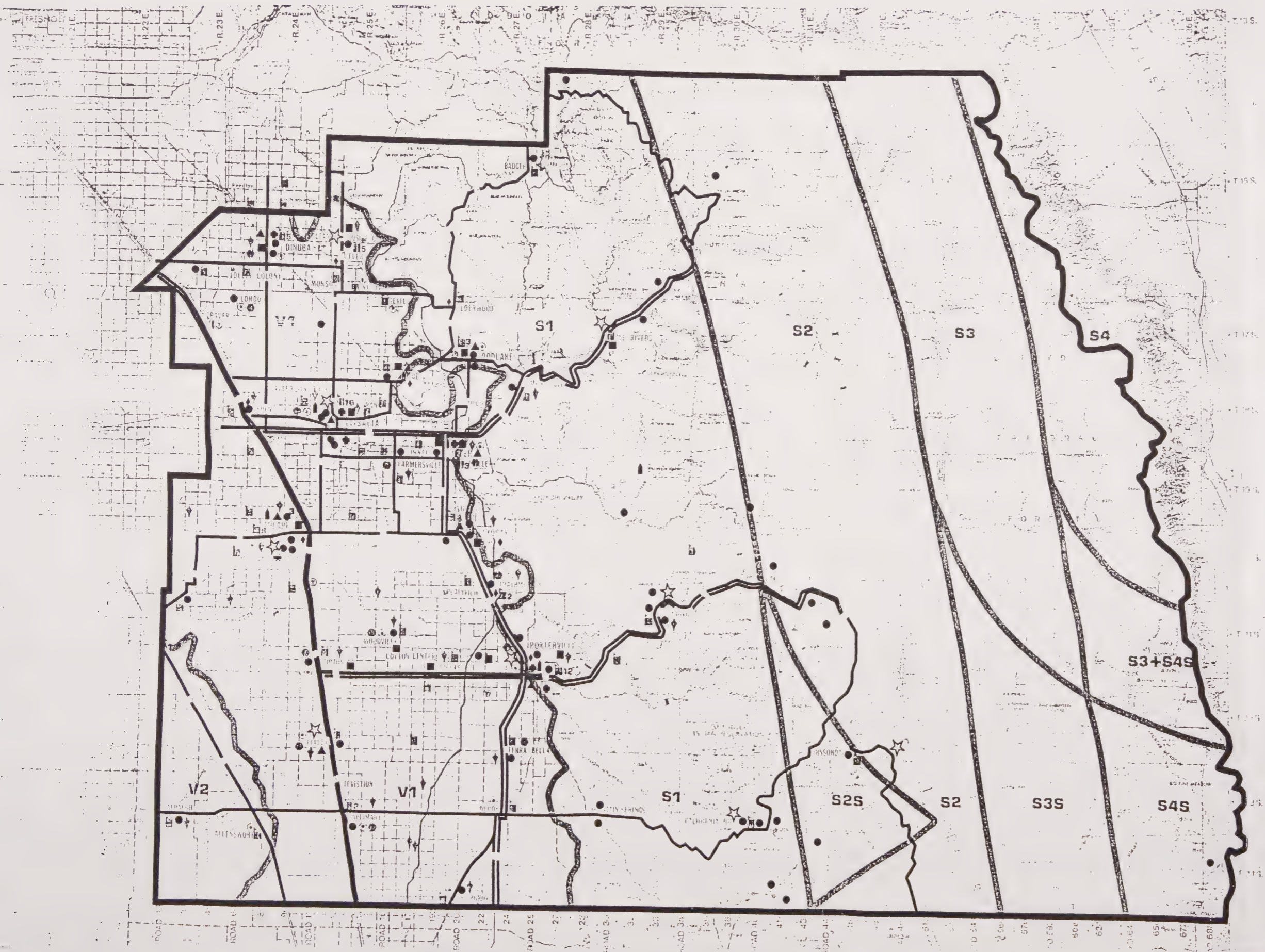
*Locations are not precise. Facilities located in relation to communities.
(Includes Seismic Safety critical facilities as listed in Five County Seismic Safety Element)

Sources: •Five County Seismic Safety Element
•Tulare County Sheriff-Coroner
•Tulare County Fire Warden
•Water & Waste Management Element
•Tulare County Office of Emergency Services

November 1974



PREPARED BY TULARE COUNTY PLANNING DEPARTMENT



CHAPTER VI

Seismic Hazard

The subject of Seismic Safety is included within the scope of this document only superficially. This element recognizes the vast amount of work already completed within the context of the Seismic Safety Element of the General Plan prepared in conjunction with Fresno, Kings, Madera, Mariposa and Tulare Counties, and recognizes the important relationship that exists between fire service, disaster service, police and other emergency service operations. At such time as a seismic disaster might occur within Tulare County or adjacent to the County on major fault systems, it would be necessary for the County to obtain assistance from the Federal and State agencies through the Office of Emergency Services. The Office of Emergency Services maintains liaison contact with the necessary agencies that would be required to respond to a seismic disaster.

The Seismic Safety Element ^{31,32}

The Seismic Safety Element consists of two parts. Part I is a technical support document that recognizes earthquake hazards and the level of risk associated with such hazards; recommends engineering standards and criteria to be used for designing structures, particularly those considered to be critical, and includes a statement on goals and objectives for reducing seismic risk. The Summary and Policy Report recognizes those policies and recommendations that are deemed to be important for each of the seismic zones indicated in the Seismic Safety Element. It is by seismic zones that the level of risk for specific areas within the County of Tulare and adjacent counties is indicated. Those policies and recommendations specifically related to Tulare County are found within Zones indicated on the map titled Safety-Critical Facilities.

Seismic Risk Zones

Seismic risk zones were established, using scientific procedures, mathematical analysis, logs from both oil and water wells on the Valley floor, geological interpretation, distance from fault zones, the ground motion characteristics that can be expected from major faults bordering the five-county study area, depth to groundwater, and other special characteristics of significance to the five-county area such as population distribution and economic significance of the zones.

The Seismic Safety Element points out the policies that the counties and cities within the five-county region, including Tulare County can take in order to reduce the hazards to life, property and the environment.

It is not within the scope of this Element to repeat all that was undertaken in the Seismic Safety Element, rather it is important to note here that the critical facilities listed in the Five-County Study be more elaborately detailed and location shown in the Safety Element. It should be noted, however, that there is no environment that is free entirely from risk, and in California there is no environment that is free from seismic risk. The Seismic Safety Element, therefore, suggests policies and programs to alleviate hazardous conditions through the building code, zoning ordinance, subdivision ordinance, and other appropriate means available to the County and cities for reducing seismic risks.

Relationship Between Fire Safety & Seismic Safety

Of particular significance to the Safety Element is the relationship between the Safety Element and the Seismic Safety Element. Since both Elements deal with the building code and land use standards it is particularly appropriate that the Board of Supervisors consider changes and modifications to the building code as they relate to the Seismic Element and the Safety Element, in conjunction with one another. The Seismic Safety Element suggests that Chapter 70 of the 1973 Uniform Building Code be adopted by the County and cities. The Safety Element recommends the adoption of the Uniform Fire Code as a part of the Uniform Building Code regulations for the County and cities. The protection of structures and critical facilities through regular inspection and enforcement procedures should be done in a way that results in the least amount of confusion and disruption to the community. This implies that safety precautions should be looked at comprehensively when field inspecting structures for seismic and fire safety. It would also be appropriate to inspect for health and sanitation at the same time. In addition, those recommendations included within the Housing Element - 1973 are reiterated here:³⁷

It is recommended that the County amend the existing investigative "complaint only" policy to an ongoing, active, program designed to eliminate unfit, unhealthy, dangerous, structurally unsafe, and fire hazardous housing units which are in such condition as not to be reasonably repaired or rehabilitated. All departments or agencies having knowledge of such units or the vacancy of such units should immediately notify the Building Department, Fire Agency, Health Department, Planning Department and other concerned agencies.

It is recommended that the Health Department be given the authority to conduct complete housing inspections in regard to any health or sanitation problems.

It is recommended that the Board of Supervisors instruct the Building Department, Health Department, and the Division of Forestry (Fire Protection Personnel), to identify, locate, and record all deteriorated, dilapidated housing units within the County.

It is further recommended that the Board of Supervisors instruct the Building Department, Health Department, and Division of Forestry's Fire Protection Agency to create a team to inspect all deteriorated and dilapidated housing units in the County. This team would recommend and carry out appropriate actions such as advice, assistance, red tagging (and when necessary) posting and removal of housing units. These departments should keep a continuous record of action taken and progress made in this program to have repaired or removed, all unfit, unhealthy, unsafe, and fire hazardous housing units in the County. A status and progress report should be submitted to the Board of Supervisors yearly. If necessary, added staff should be obtained from other departments to expedite removal of these unfit housing units.

It is further recommended that each incorporated city within Tulare County follow a similar program as outlined above (if such a program does not exist) and that they coordinate their records with the County.

It is recommended that the County Counsel investigate methods of shortening condemnation procedures which now require approximately six months before a housing unit can be condemned and be demolished. Visalia's workable procedures should be studied.

As part of the County's and cities' increased efforts to remove dilapidated units, families living in such units should be given consideration in the allocation of housing units produced by publicly-assisted housing programs.

The recommendations of the Housing Element apply equally as well to other structures that are used by the public, such as restaurants and theatres, etc.

In addition, those recommendations included within the Flood Plain Management Studies prepared by the County that are appropriate to the safety of residents and the protection of the environment including structures, places of work and public facilities (particularly critical facilities)

should be reviewed at the same time as field work is undertaken for other safety measures.

It is recommended that the Board of Supervisors carry out the recommendations of the Seismic Safety Element and the recommendations of the Safety Element that suggest a safety committee be charged with responsibility for making certain that safety requirements do not become an economic burden to the residents of the County and that safety requirements are uniformly administered throughout the County. That Committee should also be charged with making recommendations regarding areas within the Urban Area Boundaries and outside of the incorporated cities.

Seismic Risk Map

As part of the Seismic Safety Element of the General Plan of Tulare County, a map showing the location of seismic risk zones, epicenters of known earthquakes that have occurred over the last 40 years and their relative magnitude has been prepared. This map may be obtained from the Tulare County Planning Department; however, it is not included within this Safety Element. Instead an abbreviated map showing the seismic risk zones and a description of those zones is included here. The policies appropriate to the specific zones within Tulare County that are shown on the Five-County Seismic Map have been adopted as the Seismic Safety Element of the Tulare County General Plan.

Critical Facilities

The critical facilities called out in the Five-County Study are shown on an accompanying map. A listing of the critical facilities is included in the appendix of the Seismic Safety Element.³²

It should be noted that the critical facilities list, as it relates to seismic safety, is also appropriate to fire safety and flood hazard since the structures that are called out as being critical that are necessary for utilization during times of disaster should all be treated in such a way that the policies contained in the General Plan Elements of the County recognize the importance of these structures.^{2,32,16,67} In times of flood many of these structures would be necessary for housing people, and in times of seismic disaster many of these structures would have to be put to use to care for injured and to provide a place for effective community organizations to operate. In times of fire hazard these structures would be most critical since they would have to be evacuated. Schools would be in great demand along with hospitals. In the event of a nuclear disaster the fallout shelters would be located primarily in substantial structures.

It should be noted that the nuclear fall-out shelters were not called out in the Five-County Seismic Safety Element; therefore, they have been added to the critical facilities listing in this report. In addition, the Seismic Safety Study calls out fire stations in general, as being critical facilities, whereas, this report specifically locates them. This report extends the definition of critical facilities. The Fire Department would have to respond in times of disaster and the functioning of stations is of utmost importance. For these reasons many of the older stations within the County have been indicated as potentially undesirable at such time as funds become available and the Board of Supervisors or, in the case of the cities the City Councils, can replace them. In several cases priorities have been indicated where structures are unusually old or fall within the structural characteristics considered unsound seismically.³²

Secondary Hazards^{13,31,32}

An additional aspect of the Seismic Safety Element that should be mentioned in the Safety Element is the consideration of secondary hazards such as tsunamis, seiches, landslides, rock falls, soil subsidence and liquefaction of soil. The Seismic Safety Element describes each of these kinds of possible hazards; in the case of landslides, rock falls, soil subsidence and liquefaction, the areas most susceptible to these hazards are pointed out on the Five-County Seismic Safety Element Map. Generally, the degree of risk associated with the secondary hazards is a direct result of such activities as construction, road building, lumber operations and other resource extraction processes. Within the mountainous areas of Tulare County there are zones that are susceptible to landslides, rock slides and other such natural disasters. In many cases these disasters can be avoided with the use of proper engineering techniques and consideration of second alternatives for location of facilities, roads, etc., or elimination of the hazard itself by engineering processes.

Localized Hazards & Land Use Decisions

Many of these hazards are localized in effect and must be determined as part of onsite investigations. The Seismic Safety Element and the Safety Elements do not go into detail regarding many of the localized kinds of natural hazard problems

that would occur at a specific site. Instead the Seismic Safety Element and this Safety Element both include the recommendation that:

Specific sites be examined by an engineering geologist where there are suspected seismic safety problems. It is also recommended that if a building permit is being considered for a site having a potential fire hazard, that the Fire Warden should review the individual projects and make recommendations regarding risk of hazard associated with the use of materials, types of structures, location of structures and subdivisions, road widths, location of fire hydrants, water supply, and other important considerations regarding fire hazard.

It is also recommended that the County Planning Department continue to implement through the subdivision and zoning procedure, the recommendations contained within the Flood Plain Management Studies already completed by the Planning Department as part of the on-going safety requirements to be considered within the development process.

The same recommendations hold true for the incorporated cities within the County. It may be possible to combine resources within the County in some cases where the County has specialized individuals dealing with safety or seismic hazards and fire control. Cities should contract with the County on a joint basis to utilize those services and maximize them most effectively; thereby bringing about a safer environment in and around the cities within Tulare County.

The map titled "Safety Critical Facilities" shows the seismic zones as depicted on "PLATE I" of the Five County Seismic Safety Study. Each zone represents how geological and soil conditions, distance, etc. affect the shaking characteristics of an earthquake on major known active faults.³¹ It is not appropriate that any one zone be indicated as more hazardous than another since each zone varies in its unique natural and man-made characteristics. In general, zones V1, and S1 are "safer" than zones V2, and S2. Secondary hazards resulting from landslides or collapsible soils may be of greater significance in some zones. A more detailed description of the zones is included in the Five County Seismic Safety Element Study, which was completed on a regional basis due to the need for developing policy on the effects of ground shaking.

Hazardous Land Use Relationships

Much has been said already within this report about the hazardous land use relationships with respect to structures within the wildland areas and the more urban areas. (See sections dealing with wildland and structural fire hazards.) Hazardous land use relationships can be classified into two categories: natural environment and man-made environment. This section deals with the potential for conflagration and summarizes the above sections.

Environmental Risks

Left alone, the natural environment in Tulare County, whether it be in the valley or the mountains, poses a considerable wildland fire danger during the long summer months. People have reduced the risks of a fire occurring over much of the rural areas of the valley with the introduction of farming. Irrigated fields have little danger of extensive burning. In the valley grasslands, foothills and mountains however, the fire danger is only one of many hazardous land use relationships.

Topography increases natural risk by creating updrafts that move fires quickly; swollen streams can remove critical bridges, roads and communication facilities within a short period of time; additional hazards can result with secondary impacts from earthquakes, such as rock slides, mud slides and erosion. In the higher mountains, danger from snowslides and earth hazards prevent access from the eastern side of the County.

With modern engineering techniques, the hazards associated with the use of land in the higher mountains and foothills have been reduced. Fire and police services are available to residents living in remote areas via dirt roads and emergency aircraft.

Environmental Risks & Development

The greatest prevalence of hazardous land use relationships occur when rural and urban areas interface. Fuel loading, critical weather, water availability, fire service, and other factors discussed previously begin to take on new form. Homes with shake roofs only eight feet apart have the potential for acting as heavier fuel load than do many natural environments. Added to this typical urban fringe problem is the presence of larger numbers of people, automobiles and use of inflammable materials, and barriers to fire suppression such as fencing, irrigation ditches, utility lines, etc. The result is an extremely dangerous and highly valued environment, particularly in the foothills.

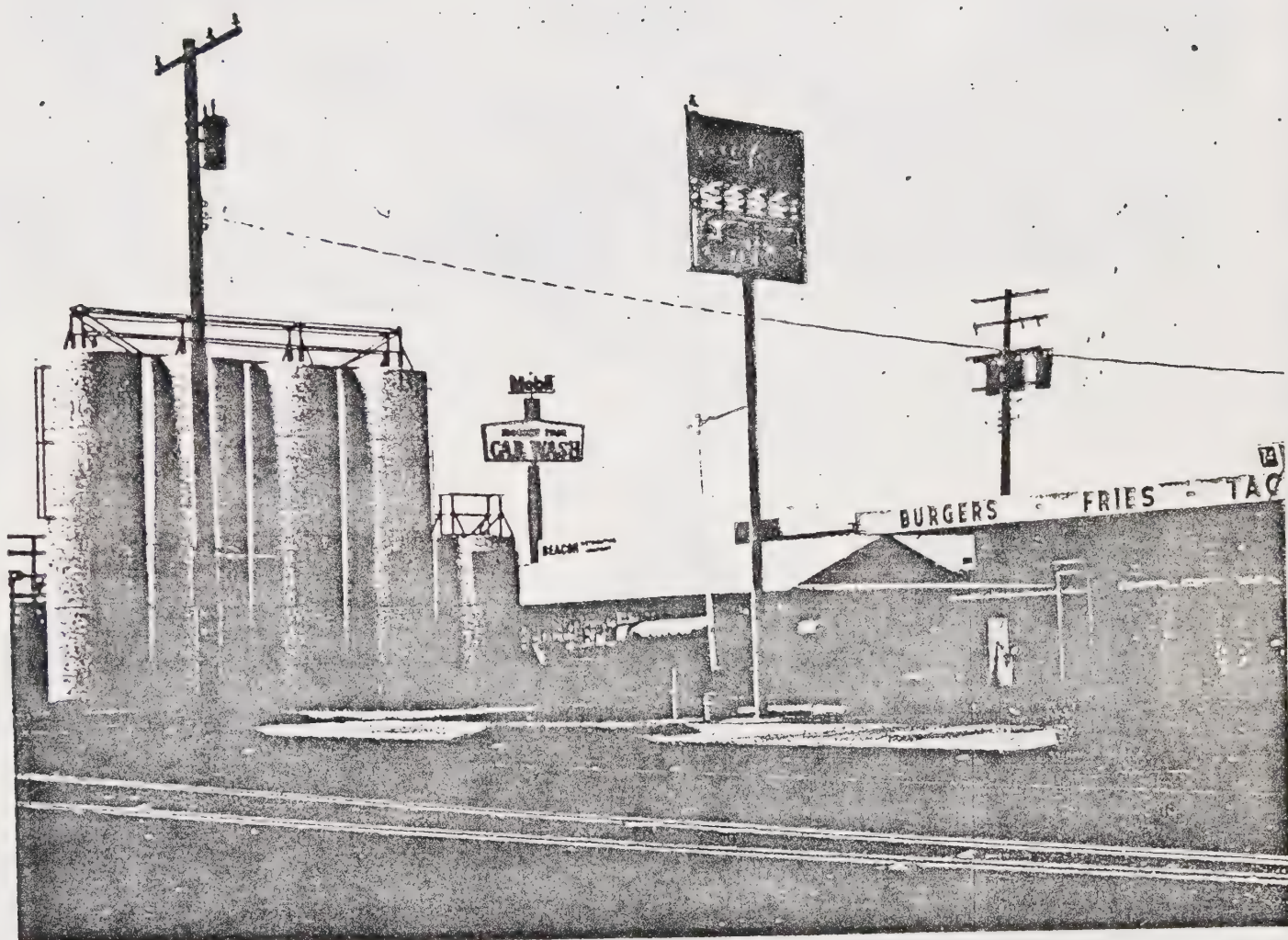
The large fires that have swept through the Malibu area of Southern California periodically have been some of the most costly and disastrous in California history. This potential for what is termed "conflagration" is considered by fire insurance companies to be most important when developing insurance rates.⁴⁵ Conflagration potential can be reduced through proper subdivision design, street widths, brush clearance plus controlled burning in and around urbanizing areas.

A supplementary staff report on "no-burn" areas for Tulare County, including land use and boundaries of communities, (urban area limits as presently prescribed in the County's Urban Area Boundary Element), has been prepared as a supplement to the Safety Element. Recommendations for providing additional solid waste services plus existing air pollution control regulations and the County Fire Warden's responsibilities are outlined. Weed abatement in and around urban areas remains as one of the most persistent problems that the County and cities face.

In general, it is important to recognize that many possible hazardous land use relationships exist within the County; but the most probable hazards are depicted on the fire incidence maps, flood prone area maps, and seismic risk zone maps for the County. This report recognizes a higher probability of recurrence associated with natural phenomena that can be statistically proven to be accurate; accurate enough for public officials to base policy decisions upon if they wish to do so.

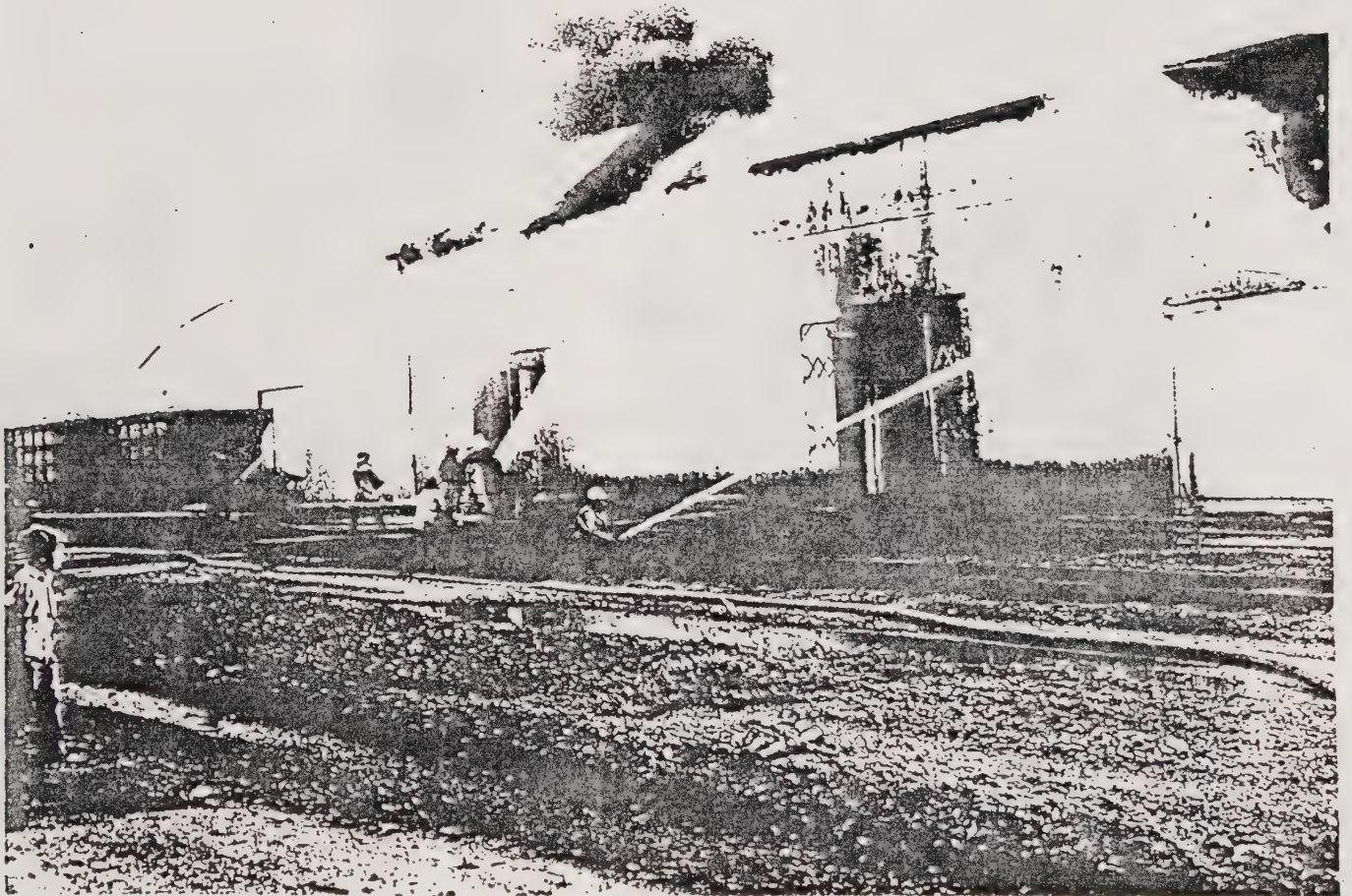
In addition, this report also recognizes the changing pattern of land use and accompanying fire service potential of the County as new industries come to the County,⁵⁶ investment levels increase, and it becomes more difficult for the County to provide safety funds from the property tax base. Risk levels for the County and its citizens will increase. Long range cost to the County and cities can be offset in large part through careful consideration of land use relationships and the total effect of land use decisions upon public service and facility costs.

Finally, it is important to recognize the hazards associated with chemical and fuel spillage in an agricultural county, since these can be environmentally damaging to water quality and consequently to agriculture. In addition, the Public Works Department must provide assistance in rural areas when these events occur. Photographs depict typical kinds of possible hazards as a result of recent accidents.



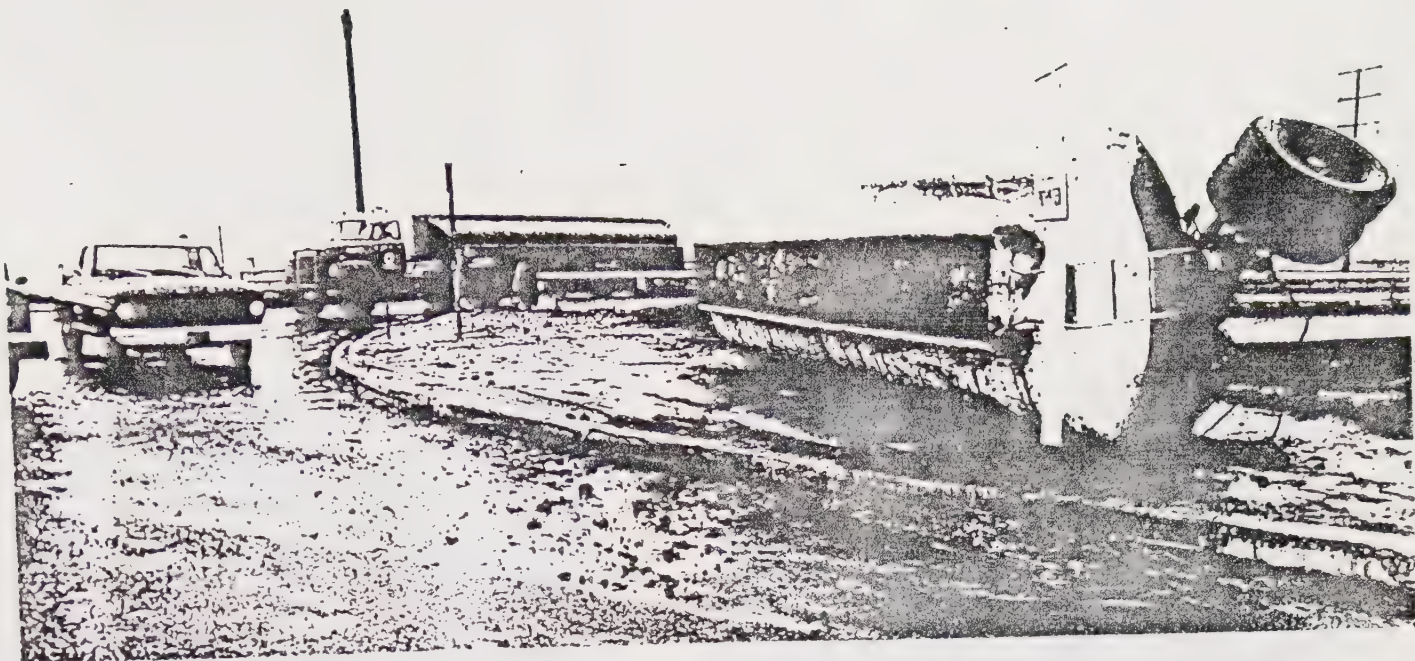
Fuel storage in a city adjacent to structures where large numbers of people are apt to congregate can often be dangerous. This particular fuel storage depot is close to the highway and has the potential for becoming a

dangerous condition. Careful land use planning is necessary in order to insure more adequate means of abating this kind of potential hazard. This can often be done through the environmental impact assessment process or the land use planning process.



A packing plant and cold storage facility on fire has created an interesting spectacle for the young boy at the left. Unfortunately this facility will cost the tax payers a good deal

of money as the insurance rates go up. Note the blocking of rail facilities and the close proximity of adjacent packing houses and cold storage plants.



This truck has overturned with a full load of zinc sulphide. It is difficult to place a risk level on this kind of incident but the need to coordinate emergency services activity

is evident. The Tulare County Office of Emergency Services maintains an inventory of available equipment for use in disasters of this type. Zinc sulphide is commonly used for industrial purposes and is high in salt content.



Another truck has overturned on State Route 99. In this case, molten sulphur hardened to a crystalized consistency almost immediately on contact with the cold pavement and highway work crews labored most of the afternoon scraping the material off the road. Fortunately no one was injured in this accident, but the freeway was closed for four hours. California

Transportation Department workers cleaned up this hardened mass of sulphur utilizing bulldozers. California Highway Patrol and the California Division of Forestry were called for assistance in washing down the area and helping to reroute traffic along the shoulder of the highway.



The photographs above show the result after a truck filled with gasoline spilled from the highway and was contained as best as possible. Often these kinds of chemical or fuel spills, once they enter the water system, can become dangerous to farmers and users of water down-

stream. Due to the agricultural nature of Tulare County it is necessary to maintain adequate equipment to control these types of hazards. The Emergency Services Office and the Tulare County Fire Warden work together in this effort.

Nuclear Hazards 16,40,36

There are two possible sources of nuclear hazards (1) nuclear radiation and fallout from atomic and hydrogen bombs; (2) nuclear radiation hazards and thermal pollution from peacetime uses, principally associated with nuclear-powered reactors.

It is beyond the scope of this element to deal effectively with the risks associated with nuclear radiation from atomic and hydrogen bombs. The County Office of Emergency Services (OES) has prepared emergency contingency plans to deal with such a disaster if it should occur. It should be noted, however, that Tulare County is most likely not a targeted area, since it is of a relatively minor strategic importance as compared to larger metropolitan areas. More likely is the possibility that the County would serve as an evacuation center for persons fleeing the major population centers of Los Angeles and the San Francisco Bay areas. It is beyond the scope of this Element to discuss the "possibility" of nuclear war.

The second source of nuclear hazards, i.e. those resulting from the peacetime uses of the atom, principally nuclear reactors for electrical power generation, x-ray

machines, etc. could present minimal hazard if adequate safeguards and precautions were to be provided. This element considers nuclear material from a seismic point of view, a relatively reasonable location for such facilities.

The construction of a nuclear reactor in the San Joaquin Valley, and especially within Tulare County, would present possible nuclear hazards. The hazards might be associated with the reactor site itself, or the transporting of nuclear fuel through the County on its way to a disposal site. Other nuclear hazards not of concern to the County and therefore not discussed are associated with mining uranium, the enrichment process, reprocessing nuclear fuel, and disposal. These are very real hazards and they should be weighed carefully if a nuclear reactor is to be sited in the County. However, since they present no real hazard to County residents at this time, they are not considered as probable safety hazards in this report.

There are primarily two possible hazards associated with nuclear reactors: (1) radiation leakage from the reactor or from spent fuel when being transported, and (2) thermal pollution from the vast amount of heat generated by the reactor.

During normal operations, there are periodic radiation leaks. These leaks occur mainly through the cooling system.

Granted that the level of radioactivity released is fairly insignificant and more recent design innovations have resulted in further reductions, a person would receive more radiation from one cross-country round trip plane ride than from leaked radiation in an entire year if the person lived next to a nuclear reactor.

The principal concern over radiation leakage from a nuclear reactor is if something should go wrong with the controlled reaction process, then it could lead to disaster.

There is no possibility that the reactor could explode like an atomic bomb because the uranium fuel is not rich enough in uranium-235 (the fuel used for power reactors); about 95% U-235 is necessary for an atomic bomb. In a reactor the percentage of U-235 is less than 5%.

What would constitute a major accident? If the nuclear reaction became uncontrollable, or so "hot" that the cooling devices could not prevent the nuclear fuel from melting the core of the reactor, then production of a large radioactive steam or chemical explosion would occur.

The Atomic Energy Commission (AEC) has set certain standards and criteria to be met by manufacturers to make such a disaster appear as unlikely as possible. There are automatic reactor shutdown devices, provisions for emergency cooling should the primary coolant be lost, auxiliary electric power systems to keep pumps and safety devices operating should the primary power source be cut off, and finally, a containment structure constructed to withstand the largest explosion the designers regard as possible.

There have been several problems to date with the reactors that have already been completed and operating. Fortunately, none have been too serious and back-up systems have prevented an explosion. However, no one really knows what the chance of a major accident actually is. Some of the systems have never been actually tested to see if they would really prevent a major accident. What people are questioning are the assumptions that engineers have based their design specifications upon. Moreover, the seismic

hazards in Tulare County to nuclear reactors are not fully understood or are otherwise unpredictable. An earthquake "could cause strains in an undefinable amount and direction." (ERME, p. 145) on the other hand, the Seismic Safety Element recognizes the probable hazard from earthquake resulting from known active faults to be minimal. There is disagreement among seismologists as to adequacy of available data for making such decisions, however. Consequently, the final decision as to "acceptable risk" must be a public one.

Reactors built to withstand earthquakes in other areas have been actually subjected to a direct seismic disturbance. Structural design specifications recommended by the Atomic Energy Commission to mitigate the hazards from possible seismic/nuclear events are designed to provide sufficient protection from a nuclear disaster.

Finally, at the end of the functional lifespan of the reactor - presently 20 to 30 years - there remains the problem of what to do with the reactor and its radioactive parts. It is presently considered too expensive to decontaminate the reactor, so it is the policy to seal off the reactor. However, since much of the material will still remain radioactive for several hundred years, it remains as a legacy to future generations to insure that they protect themselves from that radiation source.

It is recommended that the establishment of nuclear power facilities in Tulare County be voted upon by the public at large and that public hearings be held prior to construction of nuclear facilities.

The second concern of possible radiation leaks comes when the spent fuel must be transported from the reactor to a re-processing plant which extracts U-235 and plutonium-239. The fuel is shipped by rail or truck in special casks weighing from 20 to 100 tons and holding between one and ten fuel elements each. Since the fissionable products continue to decay, the fuel elements are hot thermally as well as radioactively, and they could melt. For this reason each cask is supplied with a self-contained cooling system. The casks are designed to withstand severe impacts, fire and immersion in water. So far, no cask has ruptured. It can only be hoped that the probability of one ever erupting is slight.

Thermal pollution of the air and water is also a hazard, particularly to the environment and consequently to people and all living things. Nuclear power plants generate more on-site thermal pollution than modern fossil plants of the same electrical capacity. For example:

"A fossil fuel plant operating at a power level of one million KW and an overall efficiency of 40% will warm about 30 million gallons of water per hour by 15 degrees Fahrenheit. A nuclear plant delivering the same amount of electricity and operating at 32% efficiency causes the same temperature rise in about 50 million gallons of water per hour."36

When this heated water is returned to the river, lake, or ocean it has adverse effects upon the natural ecological system (ecosystem). As water temperature increases, the metabolic rate of plant and animal life increases, and they require more oxygen. However, as water temperature increases, the level of dissolved oxygen in the water decreases; thus while the aquatic life requires more oxygen, there is actually less available. Up to the point at which oxygen becomes a limiting factor, there is an increase in the rate of growth of aquatic life as temperature increases.

Growth will first appear noticeably among the lower forms of life - planktonic plants and animals such as algae and rotifers. Depending upon the size of the body of water into which the heated water is dumped, the growth of algae can be rapid, causing an algal scum to form near the surface, robbing the other aquatic life of more needed oxygen, thereby further disrupting the natural ecosystem. Man suffers from this thermal pollution in that: (1) important food and sport fishes decline in number, i.e. carp replaces trout and bass; (2) algae and weeds ruin the recreational potential of water; (3) the high algal content of drinking water makes the water difficult to purify. In addition, diminished oxygen content of warm water causes the waste products of man to be decomposed more by anaerobic (oxygen-less) bacteria which produce odors and scum. This results in further fish die-off due to rates of waste input that could otherwise be tolerated if aerobic bacteria, which require the presence of oxygen, were more plentiful. Anaerobic bacteria decompose complex organic molecules into odorous substances such as methane, carbon monoxide and ammonia,

whereas aerobic bacteria produce substances such as carbon dioxide, water, free oxygen and nitrates.

Water released at a higher temperature, evaporates more quickly. This can have two effects on water-short, agriculturally oriented, Tulare County: (1) greater evaporation means that there will be less water downstream for other users; (2) the concentration of minerals, already present in water tends to become greater.

All waste heat discharged into a body of water is eventually transferred to the atmosphere. If the water is first passed through a cooling tower before discharged, then great quantities of water vapor and water droplets are released into the air. Although not much is known of the exact extent of the effect upon the local climate an increase in moisture content (relative humidity) has been known to cause local ground fogs and frosts. A reactor and cooling tower at a foothill site (such as the once-proposed Frazier Valley nuclear power plant) might have an adverse effect upon the many citrus groves located at the valley margin. Even so-called dry cooling towers, which act like a giant radiator recirculating the water in a closed system, still would produce great quantities of heat locally.

In conclusion, the hazards associated with nuclear reactors are numerous, complex and with many ramifications not all of which are widely understood. It can only be hoped that every aspect and consequence will be considered before deciding upon whether or not to allow nuclear power plants in Tulare County so that the level of risk to lives, property and the natural environment will be minimized.

It is recommended that the Board of Supervisors take a regional perspective on the problem of nuclear power plant siting and work in conjunction with other counties, the State and Federal government to assure the citizens of Tulare County that nuclear hazard is minimized to the greatest degree possible.

Siting of nuclear facilities in the South San Joaquin Valley should include public hearings in the entire region. It is recommended that if nuclear reactors are sited in Tulare County or the South San Joaquin Valley, that they be constructed underground in a geologically stable rock formation, and deep enough so that if an accident were to occur, the effects would be localized.

CHAPTER VII

JURISDICTIONS OF FIRE & POLICE PROTECTION AGENCIES IN TULARE COUNTY

Land within the County is owned by Federal, State, County and municipal levels of government, and by private citizens. Likewise, fire protection is provided by several different agencies as well as volunteer units. The following is a discussion of the jurisdictions of each of the agencies responsible for fire protection within the County.

National Forest Service - Provides fire protection for most of Sequoia and Inyo National Forests, and the Tule River Indian Reservation. Structural fire protection to private property within Sequoia National Forest in the general vicinities of Camp Nelson and Panorama Heights are provided by California Division of Forestry Schedule "A" fire stations. (See California Division of Forestry jurisdictional responsibilities below). Private property in the California Hot Springs area receives fire protection from a Paid Call Fire Station (volunteer).

National Park Service - Provides fire protection for Sequoia and Kings Canyon National Parks. Private property in the Wilsonia area of Kings Canyon National Park is provided with fire protection from a California Division of Forestry Schedule "A" fire station.

Bureau of Land Management - Provides fire protection for lands administered by them in the extreme southeastern portion of the County. They man and operate a fire station at Chimney Creek during the critical fire hazard season from June to October.

California Division of Forestry - (CDF) Provides fire protection for the remaining portions of the County, including those areas mentioned within Kings Canyon National Park and Sequoia National Forest.

Incorporated Cities - Incorporated cities of Dinuba, Lindsay, Porterville, Tulare, Visalia and Woodlake provide for their own fire protection within their city limits.

Administration & Coordination⁵⁴

There are mutual aid agreements between the various municipal fire protection agencies and the CDF. Woodlake, while providing men and equipment for their fire protection, share the same fire station with the CDF.

The CDF has eight administrative districts in the County. The headquarters is located just east of Visalia. Four districts are in the valley and include most of the

fire stations that provide fire protection for lands under the responsibility of the County; these include rural agricultural areas, unincorporated communities and urban areas outside the city limits of the aforementioned incorporated cities. In addition, the incorporated communities of Farmersville, Exeter and Woodlake have entered into contracts with the CDF to provide fire protection for their communities. CDF fire stations which provide protection to the above mentioned areas are called Schedule "A" stations, i.e., they provide protection to Local Responsibility Areas (LRA).

The four CDF administrative districts in the foothill and lower mountain areas of the County between the valley and the National Park Service and National Forest Service fire protection areas, including wildland water shed lands, are under the State's responsibility. Fire stations operated by the CDF to provide wildland fire protection within these State Responsibility Areas (SRA) are referred to as Schedule "B" stations. In all, the CDF has 28 Schedule "A" stations and 10 Schedule "B" stations (see Table titled "Listing of Fire Safety Facilities" and map titled "Fire Service Responsibility").

Note that there are Schedule "B" stations in the valley, and a few Schedule "A" stations within the SRA and the Kings Canyon National Park and Sequoia National Forest. There are instances where response to a fire may be made by a Schedule "B" unit, even though the fire happens to occur in Schedule "A" responsibility areas. In this case the County would reimburse the State for costs.

In addition to the mutual aid agreements between the CDF and the municipally owned fire department, the CDF has mutual aid agreements with the National Forest Service and the National Park Service. Moreover, the CDF will automatically respond to a fire within NFS and NPS jurisdictions just inside their western boundaries up to a line identified on the map titled Fire Services Responsibility as the Mutual Response Boundary. In the event of a fire occurring within that area, the NPS or NFS will reimburse the CDF for their assistance. And finally, there are two portions of the Sequoia National Forest protected by the CDF (also shown on map titled Fire Services Responsibility). The CDF provides initial response in these areas and is reimbursed by the NFS. The NFS would most likely provide backup assistance to the CDF which would have the primary responsibility in suppressing the fire.

Paid Call Fire Stations (PCF) - Volunteer fire departments provide fire protection to five small, sparsely populated areas of the County. They are: Camp Nelson, London, Sequoia Field, Waukena and Pine Mountain. They are assisted by nearby CDF units in the event of a fire.

Police Protection

Each of the incorporated communities provide their own police protection. The County Sheriff's Department provides police protection throughout the remaining portions of the County, through four administrative patrol areas (See Map titled "Law Enforcement Service Areas").

Headquarters Patrol Area (based in Visalia) Covers 2,031 square miles in the five incorporated cities of Exeter, Farmersville, Tulare, Visalia and Woodlake; and 40,000 people in ten unincorporated communities from Waukena and Goshen in the west to Lemon Cove and Three Rivers to the east. Also included is the northern half of the mountainous sections of the County including Sequoia and parts of Kings Canyon National Parks to the Inyo County line on the east.

Porterville Patrol Area - Covers 2,062 square miles including a population of 19,000 in two incorporated cities of Porterville and Lindsay, and 40,000 people in fifteen unincorporated communities from Richgrove in the south to Strathmore in the north, and from Poplar and Woodville in the west to Springville, Johnsondale and California Hot Springs in the east. Also included is the mountainous southern portion of the County.

Orosi Patrol Area - Covers 283 square miles of the northwest section of the County, and includes a population of about 27,000. In addition to the incorporated City of Dinuba, there are eleven unincorporated communities from Traver and Delft Colony in the west to Orosi and Seville in the east. Almost all of the area is in the valley.

Pixley Patrol Area - Covers 460 square miles in the southwest section of the County; and has a population of about 12,000 living in rural and seven unincorporated communities such as Alpaugh, Tip-ton, Pixley and Earlimart.

Mutual Aid Agreements

Adjacent jurisdictions have entered into mutual aid agreements with Tulare County

to provide fire services and to provide supplementary and backup support for fire services. The Office of Emergency Services coordinates disaster service on a regional basis through the Region IX office located in Fresno.

Dependency on support from additional counties is not a significant problem with fringe areas of the County, partly due to low density agricultural character of land uses along County boundaries to the south, west and north (excepting forest areas). The cities of Delano (Kern County), Corcoran (Kings County), and Orange Cove, Reedley and Kingsburg (Fresno County) are in close proximity to Tulare County fire stations.

Much of the area along county boundaries is inaccessible by major highways. This is particularly true along the east and northeast boundary of the County where steep slopes prevent access. Mountain peaks rise to 13,000 - 14,000 feet in height. Fire and disaster services in these areas may often require the use of aircraft for rescue and fire fighting operations. Aircraft for this purpose are based in Porterville where the Forest Service and the California Division of Forestry can stage fire fighting operations. Recent expansion of airport facilities utilizing Federal Aviation Administration funds was partially for the purpose of allowing for larger aircraft to be utilized for fighting major fires. The northern portion of Tulare County (wild-lands) is served from Fresno based aircraft.

Coordination between counties, cities, state and Federal Government should be reviewed periodically in light of present Mutual Aid Agreements, to insure that service can and will be provided to people regardless of where assistance is needed. This task could be a function of an overall County Safety Review Committee, as suggested in the Seismic Safety Element. The Committee should be charged with review of all safety programs in a comprehensive manner to insure adequate protection at reasonable cost to citizens, the communities and natural environment.

Office of Emergency Services

The Office of Emergency Services should be staffed adequately to carry out the requirements of a comprehensive disaster communication plan. In addition, the OES must maintain coordination among agencies and organizations in order to know where emergency equipment and materials can be located and utilized during disasters.

LISTING OF FIRE SAFETY FACILITIES

(Corresponds with map titled "Fire Services Responsibility")

CALIFORNIA DIVISION OF FORESTRY Schedule A Fire Stations

1. Alpaugh
2. Balance Rock
3. Camp Nelson
4. Cutler-Orosi
5. Dinuba
6. Doyle Colony
7. Earlimart
8. Exeter
9. Farmersville
10. Goshen
11. Ivanhoe
12. Kings River
13. Lemon Cove
14. Lindsay
15. Pixley
16. Poplar
17. Richgrove
18. Springville
19. Strathmore
20. Terra Bella
21. Three Rivers
22. Tipton
23. Tulare
24. Visalia
25. West Olive - Porterville
26. Wilsonia
27. Woodlake
28. Woodville

CALIFORNIA DIVISION OF FORESTRY Schedule B Fire Stations

29. Badger
30. Fountain Springs
31. Hammond
32. Milo
33. Mountain Home
34. Porterville
35. Springville
36. Tyler Creek
37. Visalia
38. Woodlake

PAY-CALL FIRE STATIONS

39. Camp Nelson
40. London
41. Waukena
42. Sequoia Field
43. Pine Mountain

BUREAU OF LAND MANAGEMENT F.S.

44. Chimney Meadows

NATIONAL FOREST SERVICE F.S.

45. California Hot Springs
46. Camp Wishon
47. Frog Meadow
48. Johnsondale
49. Peppermint
50. Poso-Balance Rock
51. Springville

NATIONAL PARK SERVICE F.S.

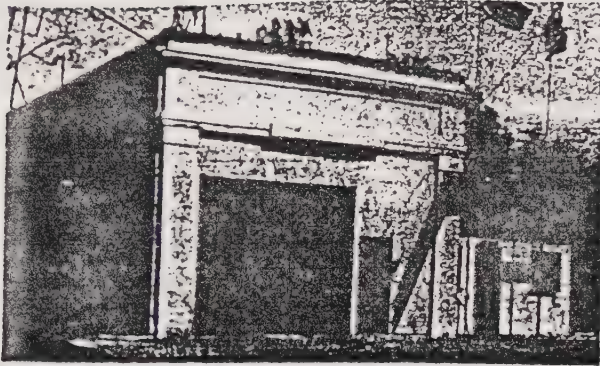
52. Ash Mountain
53. Grant Forest
54. Grant Grove

CITY FIRE DEPARTMENTS

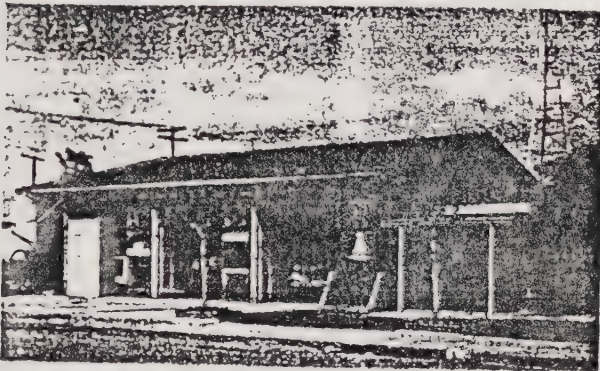
55. Dinuba
56. Exeter
57. Lindsay
58. Porterville
59. Tulare (2)
60. Visalia (2)

OTHER

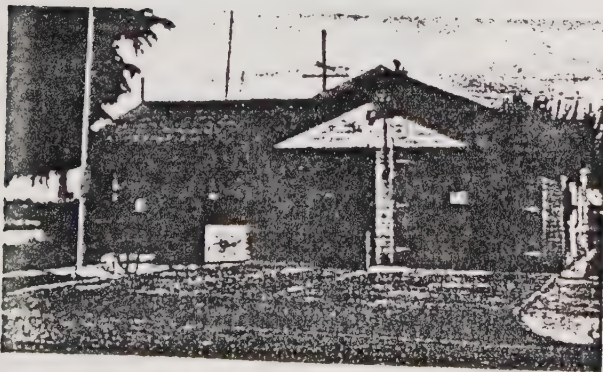
Porterville Air Attack Base:
Porterville Airport (C.D.P.)



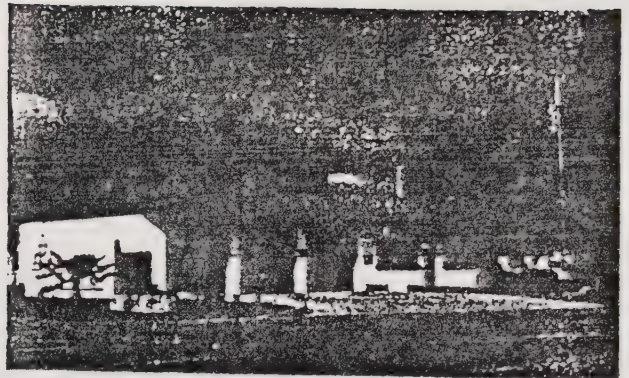
The Lemon Cove Fire Station located at Lemon Cove is scheduled to be replaced in the near future. Constructed of cement block and stucco in 1925, it is considered seismically unsafe. A new facility will be constructed to meet safety requirements. The present structure is inadequate in size, location and is located in an area where 50% or more of the housing is considered to be substandard, thus creating a heavy demand upon the station.



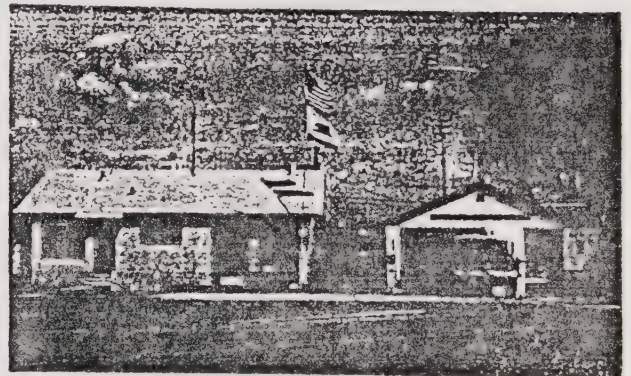
This station in Exeter is manned by city and state personnel. In this case state personnel act as county fire warden. Constructed in 1955 of brick it is considered inadequate to meet today's demands.



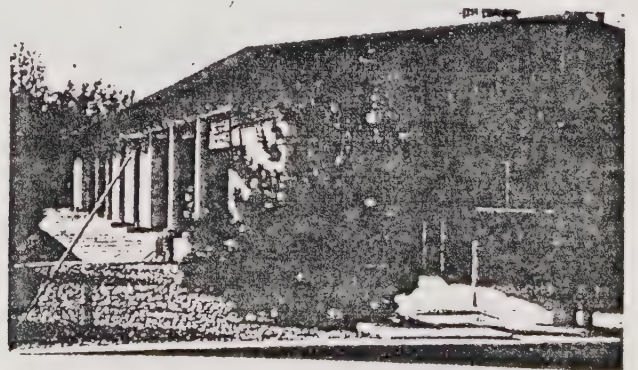
This fire station located in the City of Farmersville was constructed of cement block in 1946 and should eventually be replaced. Although in a good location and within a reasonable response time from the Visalia and Exeter stations, one of the problems most commonly found in the Farmersville area relates to wood shanties and a high number of substandard housing units, thus creating a high demand upon fire protection personnel at this station.



This station at Woodlake is made of adobe cement. It was constructed in 1941. Canals and barriers prevent the most efficient fire protection service. In addition, personnel must respond to wildland fires, wood shanties and a high number of substandard housing units in the immediate area. The closest station for back-up assistance is in Ivarhoe, nine minutes away.



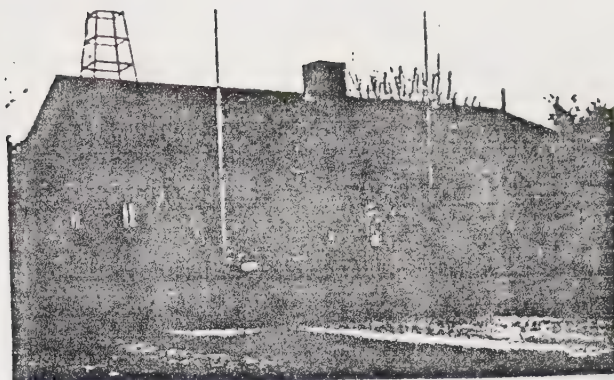
This fire station in Ivarhoe was constructed of cement block in 1952. It is considered to be a fairly adequate station. The site could not be a main fire station. The station's ability to respond to residential fires as well as wildland and industrial fires is considered the personnel at the station is inadequate. In addition, wood shanties and substandard housing are a problem within the jurisdiction of this station.



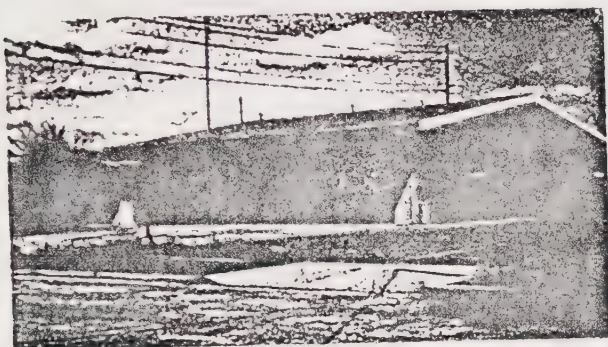
This station located on South Lovers Lane in Visalia was constructed of cement block in 1961. It is the headquarters station for the California Division of Fire as well as the County Fire Warden. It is already beginning to fall into the inadequate category because of its size for highways, canals, a large number of substandard housing units, the best service in the area, and the fact that the building is being constructed in a way that it is not able to handle the demands of the Visalia area.



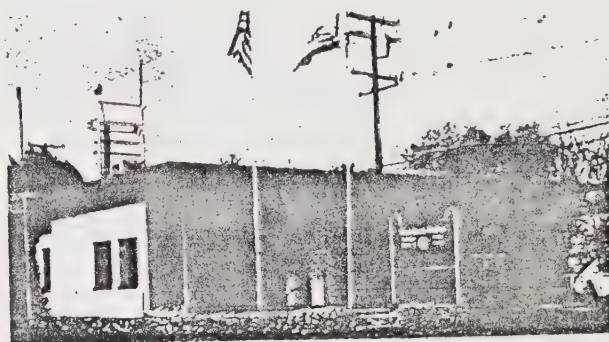
This fire station located in Earlhart, is structurally adequate, however personnel at the station feel that it does not meet their needs in terms of size and in providing them with the ability to fight commercial, residential or chemical/fuel fires. A railroad blocks their capability in one portion of the community.



This station in Alpaugh was constructed of concrete in 1956. It is adequate in many respects but difficult to fight commercial, industrial and residential fires in the area. Some barriers control the capability of this unit to respond such as roads, canals and large industrial areas. The nearest support station is located in Earlhart some sixteen to twenty minutes away.



This station located in Porterville was constructed in 1965 of concrete block. It is known as the West Olive Station and is one of the largest stations in the County of Tulare. The building is built to the proper size and will need at most a small addition and being on a rail yard makes it difficult to respond to the far end of the colony fire station and other places where they need back-up support.



This station located in Strathmore was constructed of concrete block in 1967. In terms of size and location the station is adequate, however the personnel were faced with commercial, industrial, residential and chemical fires. There were three chemical tanks in the area and the station was able to handle them with their equipment. The nearest support station, only a few minutes away.



This photograph of the Doyle Colony Fire Station shows a wood frame building that is structurally inadequate as far as the fire personnel are concerned. Its size and location are also inadequate. This station also has barriers to its response capability and the West Olive Station is the nearest station for back-up support, ten minutes away. This station should be considered for replacement in the near future.



This station located in Oiler-Quail is a prefabricated metal building constructed in 1963 and is an excellent example of what might be termed an adequate fire station. There is sufficient room for response vehicles. The high number of commercial, industrial, residential, chemical/fuel facilities in the area of Oiler-Quail in the general area contribute to a major fire station problem that personnel at this station must face. The nearest support station is at Luba, eight minutes away.

LAW ENFORCEMENT SERVICE AREA CHARACTERISTICS

COUNTY OF TULARE

TOTAL - Square Miles	4,863
Population	196,117
Personnel	186
Marked Units	38
Patrol Miles Driven	1,243,038

JAIL:

Average Daily Count	181
Capacity	257
Bookings	10,384

 PIXLEY PATROL AREA
 Unincorporated Area - 7 Communities

TOTAL - Square Miles	460
Population	11,927
Personnel Ratio 1,084:1	
Incorporated Area - None	

TOTAL PATROL MILES DRIVEN	184,053
Number Marked Units	5

Calls for Service Reportable	3,185
Felonies	313
Misdemeanors	770
Burglaries	187

 OROSI PATROL AREA
 Unincorporated Area - 11 Communities

TOTAL - Square Miles	280
Population	19,210
Personnel Ratio 1,921:1	
Incorporated Area - 1 City	

TOTAL - Square Miles	2.70
Population	7,917
Personnel Ratio 527:1	

TOTAL PATROL MILES DRIVEN	189,847
Number Marked Units	5

Calls for Service Reportable	3,263
Felonies	550
Misdemeanors	812
Burglaries	300

HEADQUARTERS PATROL AREA

Unincorporated Area - 10 Communities

TOTAL - Square Miles	2,005
Population	40,020
Personnel Ratio 1,110:1	
Incorporated Area - 5 cities	

TOTAL - Square Miles	26
Population	59,770
Personnel Ratio 664:1	

TOTAL PATROL MILES DRIVEN	429,541
Number Marked Units	11

Calls For Service Reportable	9,929
Felonies	1,432
Misdemeanors	1,926
Burglaries	820

 PORTERVILLE PATROL AREA
 Unincorporated Area - 15 Communities

TOTAL - Square Miles	2,053
Population	39,560
Personnel Ratio 1,521:1	
Incorporated Area - 2 Cities	

TOTAL - Square Miles	9
Population	18,400
Personnel Ratio 541:1	

TOTAL PATROL MILES DRIVEN	379,597
Number Marked Units	11

Calls for Service Reportable	8,094
Felonies	1,325
Misdemeanors	2,533
Burglaries	970

Data is for 1972

Source: Tulare County Sheriff Coroner

LAW ENFORCEMENT SERVICE AREAS

The map adjacent shows the law enforcement service areas of Tulare County. These law enforcement service areas were deemed to be adequate insofar as allocation of service is concerned by the County Sheriff. Substations are indicated and areas of responsibility are broken down in the field on a priority basis. The Planning Department has assisted the County Sheriff in developing a data base for allocation of daily statistics to individual areas of responsibility for any one deputy sheriff as he is working in the field. As statistics are derived from incidents they are put into the computer system maintained by the County Data Center. On a daily basis the sheriff is able to allocate resources as necessary in the field. This system is scheduled to be fully on line during the fiscal year 73-74 and will be periodically altered to fit the needs of the Sheriff's Department over the next few years. A map book for locating incidents in the field and assigning the incidents to grid cells will allow the County Sheriff to utilize a geographic base file for calling up statistics at a later date. A better understanding of incident patterns of crime throughout the County should result.

LAW ENFORCEMENT SERVICE AREAS

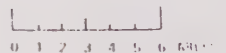
TULARE COUNTY

LEGEND

- SUB-STATION BOUNDARY
- FOOTHILL LINE
- ★ HEADQUARTERS
- SUB-STATION
- ▲ RESIDENT DEPUTY

Source: Tulare County Sheriff-Coroner

November 1974



PREPARED BY TULARE COUNTY PLANNING DEPARTMENT

FIRE PROTECTION SERVICE CHARACTERISTICS

(FOR TULARE COUNTY-INCLUDES CALIFORNIA DIVISION OF FORESTRY)

STATION AND ADDRESS	TYPE & AGE OF STATION	EQUIPMENT		PERSONNEL			STATION					INITIAL RESPONSE CAPABILITY (SIGNIFICANT)											NEAREST FIRE STATION	SUPPORT SERVICE		
		PUMPERS	TANKERS	STATE PERSONNEL	FIRE CAPTAIN	VOLUNTEERS	STRUCTURE	SIZE	LOCATION	SEWAGE	SEISMIC SAFETY	COMMERCIAL INDUSTRIAL	RESIDENTIAL	CHEMICAL FUEL	WATER AVAILABILITY	BARRIERS TO RESPONSE					WILDLAND FIRE HAZARD	WEED ABATEMENT			% HOUSING* SUBSTANDARD	
																ROAD	CANAL	RIVER	RAILROAD	OTHER						
ALPAUGH 3939 AVENUE 54 ALPAUGH	CEMENT BLOCK 1956	1	0	1	0	14	▲	○	▲	○	▲	●	●	○	●		YES	YES	NO	NO	YES	●	●	●	EARLMART 16-20 MIN.	●
BALANCE ROCK BOX 5-8 POSEY	NOT IN POPULATED AREA- SEASONAL ONLY ** (BEING REPLACED)																									
CAMP NELSON GENERAL DELIVERY CAMP NELSON	NOT IN POPULATED AREA- SEASONAL ONLY ** (BEING REPLACED)																									
CUTLER-DROS 40779 ROAD 128 CUTLER	METAL- PREFAB 1973	1 VOL.	0	1	1	11	▲	●	▲	○	○	●	●	●	●		NO	NO	NO	NO	NO	○	●	●	DINUBA 8 MIN.	▲
DINUBA 40404 ROAD 80 DINUBA	CEMENT BLOCK 1970	1	1	2	2	23	▲	●	▲	●	○	●	▲	○	●		NO	NO	NO	NO	NO	○	●	●	KINGS RIVER 7 MIN.	▲
DOYLE COLONY 1057 EAST DATE PORTERVILLE	WOOD FRAME 1948	1	0	2	0	21	●	●	●	●	●	●	●	●	●		YES	NO	YES	NO	YES	●	●	●	WEST OLIVE 10 MIN.	▲
EARLMART 808 WASHINGTON STREET EARLMART	CEMENT BLOCK 1956	1 VOL.	0	2	0	9	○	●	▲	○	●	●	●	●	▲		NO	NO	NO	YES	NO	○	●	●	PIXLEY 8 MIN.	▲
EXETER 137 NORTH F STREET EXETER	BRICK 1935	1	0	2	0	22	●	●	●	○	●	○	●	●	●		YES	NO	NO	YES	NO	●	●	●	FARMERSVILLE LINDSAY 5 MIN.	▲
FARMERSVILLE 846 NORTH MAGNOLIA FARMERSVILLE	CEMENT BLOCK 1945	1 VOL.	0	2	0	15	▲	●	●	○	●	▲	●	○	●		NO	NO	NO	NO	NO	○	●	●	VISALIA EXETER 5 MIN.	▲
GOSHEN 30901 ROAD 67 GOSHEN	CEMENT BLOCK 19587	1 VOL.	0	2	0	17	▲	●	▲	○	○	●	●	●	●		YES	NO	NO	YES	YES	○	●	●	TULARE VISALIA 15 MIN.	●
IVANHOE 32868 HAWTHORNE ROAD IVANHOE	CEMENT BLOCK 1952	1 VOL.	0	2	0	26	▲	●	●	○	○	●	●	●	○		NO	NO	NO	NO	NO	○	●	●	WOODLAKE 10-12 MIN. VISALIA 12-15 MIN.	●
KINGS RIVER 3811 AVENUE 400 KINGSBURG	CEMENT BLOCK 1955	1	0	2	0	7	▲	▲	▲	○	○	●	▲	○	●		YES	NO	NO	NO	NO	○	●	●	TRAVER 4-1/2 MIN.	▲
LEMONCOVE (BEING REPLACED) 24412 AVENUE 328 LEMONCOVE	CEMENT BLK. AND STUCCO 1925	1	0	2	0	21	●	●	●	▲	●	▲	▲	▲	●		YES	NO	YES	YES	NO	●	●	▲	EXETER 20 MIN.	●
LINDSAY 19603 AVENUE 228 LINDSAY	CEMENT BLOCK 1965	1	1	3	1	20	▲	▲	▲	▲	○	○	●	●	●		NO	YES	NO	NO	NO	●	●	●	STRATHMORE 4 MIN.	▲
PIXLEY 200 NORTH PARK DRIVE PIXLEY	CEMENT BLOCK 1971	1	1	4	2	16	▲	▲	▲	▲	○	●	●	●	●		NO	NO	NO	YES	NO	○	●	●	TIPTON, EARLMART 7-10 MIN.	▲
POPLAR 14665 ROAD 192 POPLAR	ADOBE BRICK 1944?	1 VOL.	0	2	0	10	●	●	●	○	●	●	●	○	●		NO	NO	NO	NO	NO	○	●	●	WEST OLIVE 3-4 MIN.	▲
RICHGROVE 20890 GROVE DRIVE DELAND	CEMENT BLOCK 1956	1	0	1	0	11	▲	●	▲	○	○	●	●	●	○		NO	NO	YES	NO	NO	●	●	●	EARLMART, PIXLEY 15-20 MIN.	●
SPRINGVILLE BRIDGE & MAIN STREET SPRINGVILLE	CEMENT BLOCK 1955	2	0	2	2	23	▲	▲	▲	▲	▲	●	▲	●	●		NO	NO	NO	NO	NO	●	▲	●	DOYLE 15 MIN.	●
STRATHMORE 22908 AVENUE 196 STRATHMORE	PUMITILE BRICK 1946	1	0	2	0	24	○	▲	▲	○	●	●	●	●	▲		NO	NO	NO	NO	NO	●	●	●	LINDSAY 4 MIN.	▲
TERRA BELLA 23658 AVENUE 95 TERRA BELLA	CEMENT BLOCK 1948?	1 VOL.	0	2	0	12	○	▲	●	○	●	●	●	○	●		YES	NO	YES	NO	NO	●	●	●	WEST OLIVE 10-12 MIN.	●
THREE RIVERS 41412 SOUTH FORK ROAD THREE RIVERS	CEMENT BLOCK 1958	1	0	2	0	18	▲	▲	●	●	○	▲	▲	○	●		YES	NO	YES	NO	YES	●	●	○	LEMONCOVE 15 MIN.	●
TIPTON 241 SOUTH GRAHAM TIPTON	CEMENT BLOCK 1956	1	0	2	0	17	▲	▲	▲	○	○	●	●	○	●		YES	NO	NO	YES	NO	○	●	●	PIXLEY 8 MIN.	▲
TULARE (BEING REPLACED) 1331 SOUTH O TULARE	ADOBE BRICK 1948	1	1	3	1	20	●	●	●	○	●	●	▲	●	▲		YES	NO	NO	YES	NO	○	●	▲	TIPTON 12 MIN.	●
VISALIA 1968 SOUTH LOVERS LANE VISALIA	CEMENT BLOCK 1967	2 SCH. A 2 SPARE 1 CD	1 SCD. B	5	2	14	▲	●	▲	○	○	○	○	○	●		YES	YES	YES	NO	YES	○	○	○	FARMERSVILLE 3 MIN.	▲
WEST OLIVE 22315 AVENUE 152 PORTERVILLE	CEMENT BLOCK 1965	1	0	1	2	1	▲	▲	▲	○	○	●	▲	●	▲		YES	NO	YES	YES	NO	○	●	●	POPLAR 6 MIN. DOYLE COLONY 6 MIN.	▲
WILSONIA GENERAL DELIVERY KINGS CANYON NATIONAL PARK	NOT IN POPULATED AREA- SEASONAL ONLY																									
WOODLAKE 208 EAST NARANJO BLVD. WOODLAKE	ADOBE- CEMENT 1941	1	0	2	0	15	●	●	●	○	●	●	●	●	●		NO	YES	NO	NO	YES	●	●	●	IVANHOE 9 MIN. LEMONCOVE 10 MIN.	▲
WOODVILLE 16756 AVENUE 168 TULARE	PUMITILE BLOCK 1942-5	1	1	2	0	13	▲	▲	▲	○	●	●	●	○	●		NO	NO	NO	NO	NO	○	●	○	POPLAR 8 MIN.	▲

Inadequate symbol indicated over 50% of housing units are substandard

*For new location see map
"Fire Services Responsibility"

▲ ADEQUATE ● INADEQUATE ○ NOT APPLICABLE

SOURCES:
TULARE COUNTY PLANNING DEPARTMENT
WATER AND LIQUID WASTE MANAGEMENT PLAN 1972
HOUSING REPORT, TULARE COUNTY GENERAL PLAN 1971
TULARE COUNTY FIRE WARDEN
(SURVEY TAKEN JULY 1974)

FIRE SERVICES RESPONSIBILITY

Fire service in Tulare County is carried out by a variety of agencies for different reasons. The California Division of Forestry acts as County Fire Warden on a contract basis in Tulare County. In this case, the fire services responsibility are mixed. The major responsibility of the California Division of Forestry is to contain wild land fires; however, in and near the cities and urbanizing areas the California Division of Forestry must take on the role as County Fire Warden and act primarily to save life and structures and secondarily to fight brush fires.

The National Park Service responsibility includes portions of Sequoia and Kings Canyon National Parks and several major facilities are maintained plus numerous ranger stations or look-out points which are not plotted on the map since they are not permanent in character. The look-out stations are primarily for locating fires in the national forests and national parks and communicating that information to the major fire fighting units either on the valley floor at the Porterville Airport where aircraft can be brought to fight the fire or to ground stations that have access by road to the location of the fires.

Bureau of Land Management responsibility is only within the southeast portion of the County and the majority of fires are related to lightning. State responsibility area covers all of the grassland and chaparral areas along the base of the foothills and mountains of Tulare County. These zones are separate from County fire responsibility zones since they are considered primarily State responsibility areas.

Communication systems are one of the most important factors in the process of fighting fires in the wildland areas.

Joint exercise of powers agreements between agencies are designed to resolve the problem of "who is the responsible agency." The question of responsibility is answered after the fire is extinguished.

Personnel are not assigned to the mountain areas on a year round basis. Some stations may provide either limited or no service during winter months.

The Legend on the adjacent map should read -

△ National Park Service Fire Station

▽ City Fire Station*

*The numbers adjacent indicate the number of city stations.

**FIRE SERVICES
RESPONSIBILITY**

TULARE COUNTY

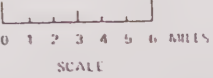
LEGEND

- CALIFORNIA DIV. OF FORESTRY ADMINISTRATION DISTRICT BOUNDARY (INCLUDES PART OF SEQUOIA NATL. FOREST)
- CALIFORNIA DIV. OF FORESTRY INITIAL RESPONSE AREA
- CALIF. DIV. OF FORESTRY MUTUAL RESPONSE BOUNDARY I.E. CDF WILL RESPOND TO FIRE BETWEEN INITIAL RESPONSE AREA AND MUTUAL RESPONSE BOUNDARY. WILL BE REIMBURSED BY EITHER NATL. PARK SERVICE OR NATL. FOREST SERVICE DEPENDING ON LOCATION OF FIRE.
- NATL. PARK SERVICE RESPONSIBILITY BOUNDARY (INCLUDES PART OF SEQUOIA AND KINGS CANYON NATL. PARKS)
- NATL. FOREST SERVICE RESPONSIBILITY BOUNDARY (INCLUDES INYO NATL. FOREST, MOST OF SEQUOIA NATL. FOREST AND TULE RIVER INDIAN RESERVATION)
- - - - - BUREAU OF LAND MANAGEMENT RESPONSIBILITY
- STATE RESPONSIBILITY AREA
- CALIF. DIV. FORESTRY - SCHEDULE A - FIRE STATION *
- CALIF. DIV. FORESTRY - SCHEDULE B - FIRE STATION *
- △ PAY CALL FIRE STATION *
- ▴ BUREAU OF LAND MANAGEMENT FIRE STATION *
- ◇ NATIONAL FOREST SERVICE FIRE STATION *
- ▽ NATIONAL PARK SERVICE FIRE STATION *
- AREAS WITHIN 5 MILE ROAD PERIMETER OF CALIF. DIVISION FORESTRY FIRE STATION
- AREAS WITHIN 5 MILE ROAD PERIMETER OF PAID CALL FIRE STATION

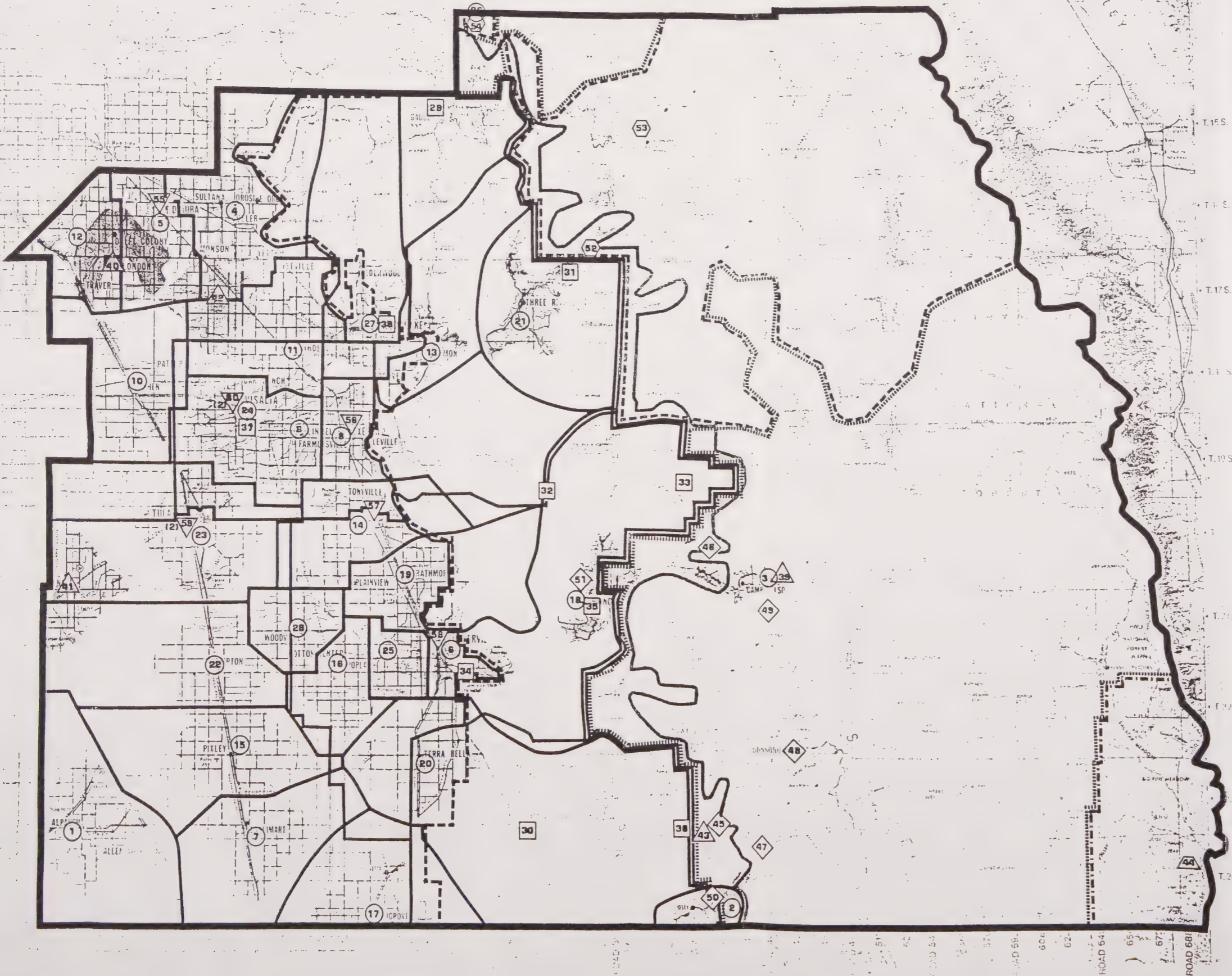
* Numbers refer to name and precise location of facility as shown on list titled Fire Services Facilities in Tulare County
• Superimposed symbols indicate 6 months responsibility to each service
• Joined symbols indicate 2 different services provided from same station

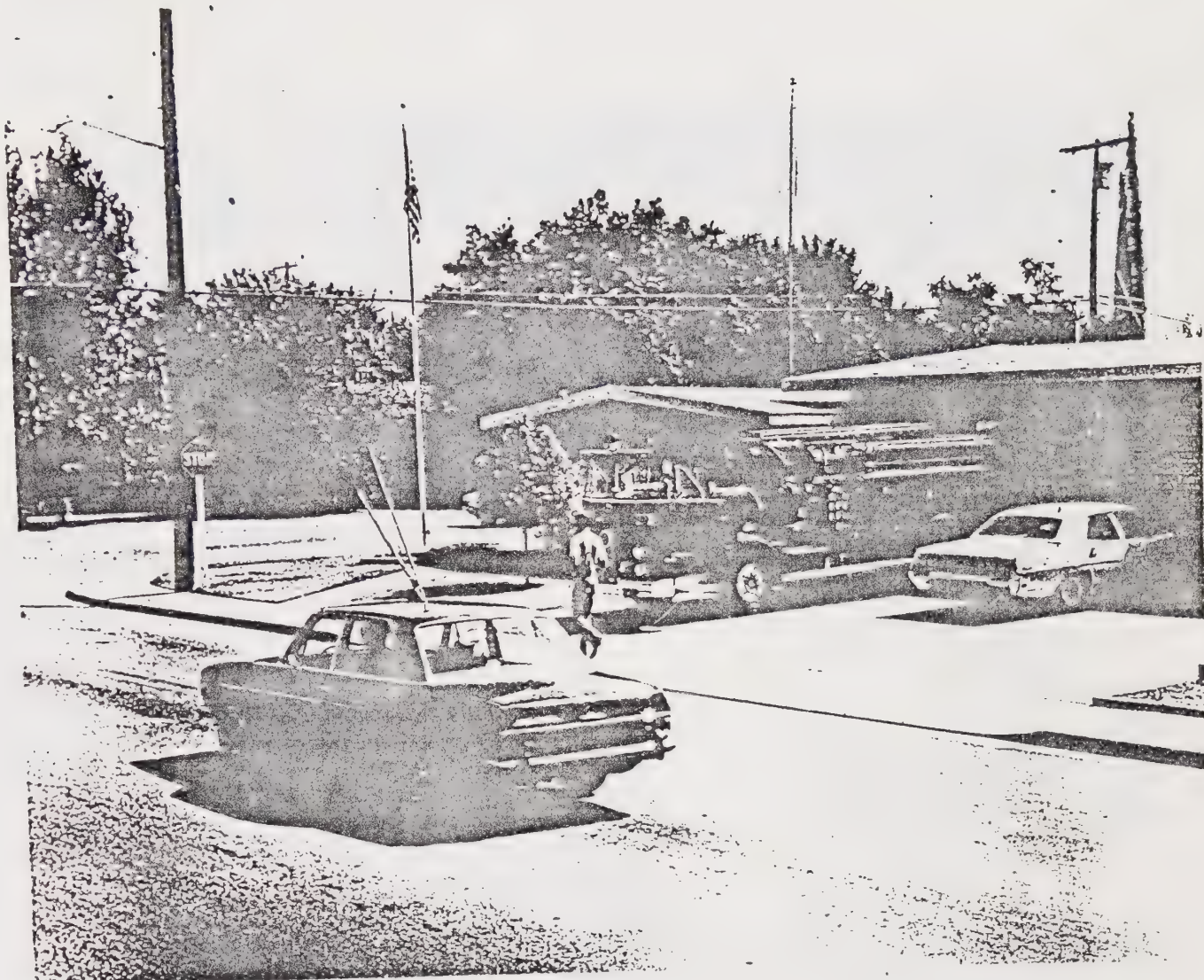
Sources: Federal Agencies listed above
Tulare County Fire Warden

November 1974



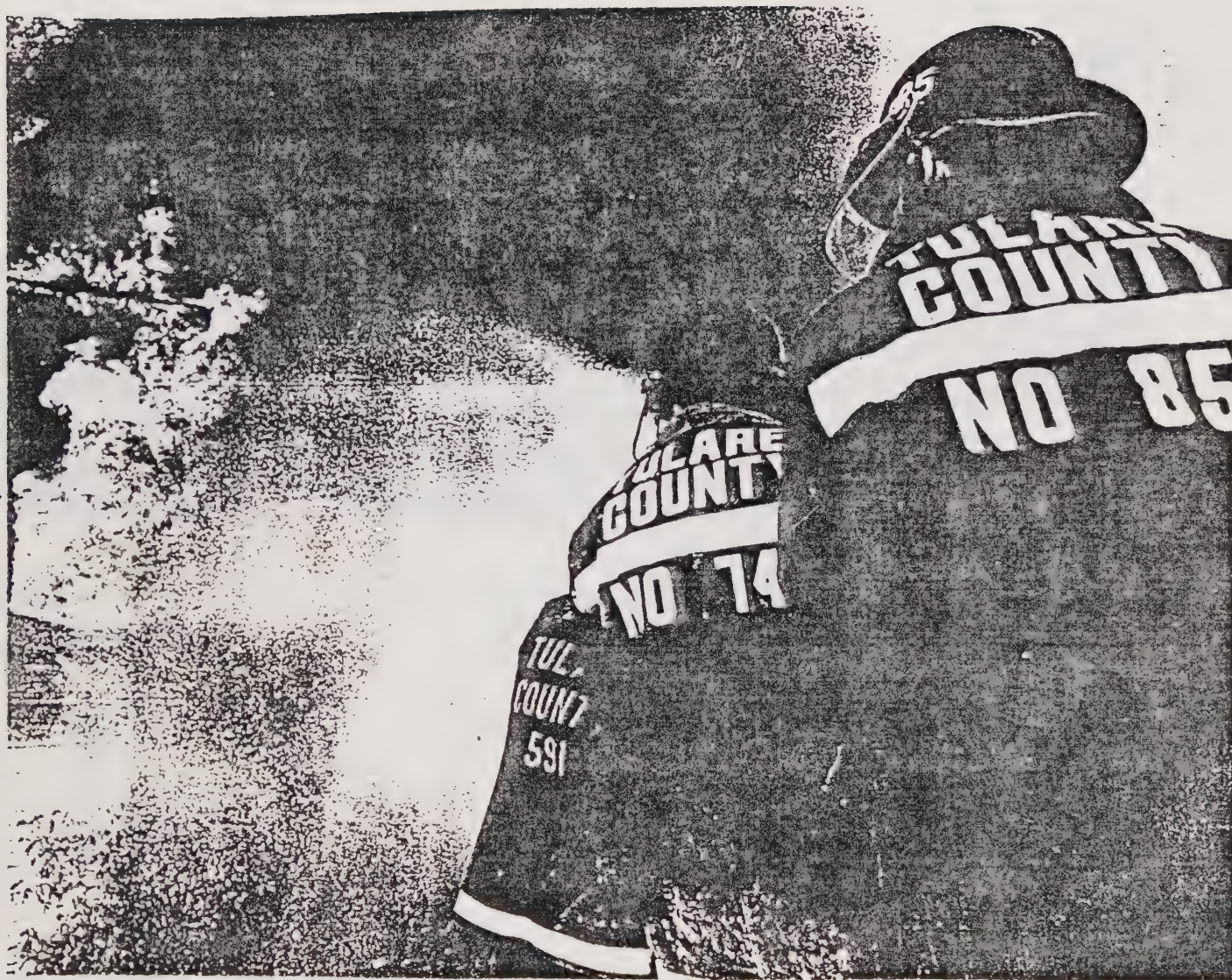
PREPARED BY TULARE COUNTY PLANNING DEPARTMENT





This fire station in Visalia is a modern one that serves not only residential areas but commercial centers and structures along Mooney Boulevard in the heart of Visalia. Trucks and equipment have to be maintained constantly and in good repair if they are to be of any use in an emergency. Within the city limits of Visalia the Safety Element recommends that three minutes or three miles be the maximum service radius and time for adequate service. Some overlap

would occur between fire service agencies but due to the high density of population, this overlap may be necessary. Another consideration for location of this kind of fire station is high assessed valuation. In a County of 5,000 square miles and with 200,000 population such as Tulare, the cost of fire insurance is very high if adequate service is not given to those areas having very high assessed valuation.



County fire fighters attack a blazing structure. In this case, a structure is already ablaze and it is unlikely that much can be salvaged from this home. Note the specialized equipment and clothing that are worn by fire fighters and the communication equipment and eye protection

devices provided County fire fighters. Modern equipment is continually being updated and the Board of Supervisors is continually appropriating funds for newer and more modern equipment to save not only the lives of residents of the community but the fire fighters themselves.

ALTERNATIVES FOR INCREASING EFFECTIVENESS

1. Part volunteer, part paid --
2. Auxiliary firefighters -- other municipal employees
3. Womanpower--dispatchers, ambulance driving, inspecting buildings
4. Police-fire consolidation
5. Reducing costs--freeze suppression services; place future burden on public through fire brigades at factories; sprinkler systems
6. Private contracting
7. Governmental contracting--mutual aid agreements with neighboring communities
8. Regionalization--reduce number of jurisdictions and pool resources
 - a. more efficient manning through the combining of small units
- b. greater operational effectiveness through better manned companies, uniform fire suppression methods, direct control of response of all companies (rather than depending on mutual aid arrangements like those in many American communities), and the ability to concentrate manpower rapidly at major fires
- c. better communications
- d. better training facilities as a result of a larger tax base
- e. more uniform regulatory code enforcement
- f. economies effected through large volume purchases and standardization of parts
- g. better recordkeeping with less total effort
9. Planning for fire protection

taken from AMERICA BURNING

EIGHT IMPORTANT FUNCTIONS FOR FIRE DEPARTMENTS

1. Fire Suppression - fire fighters need proper training and adequate equipment for saving lives and putting out fires quickly, and also for their own safety.
2. Life Safety-Paramedical Services - first aid, resuscitation, paramedical services (i.e., emergency treatment beyond ordinary first aid).
3. Fire Prevention - approving building plans and actual construction, inspecting buildings, their contents, and their fire protection equipment, public education, and investigating the causes of fires to serve as a guide to future priorities in fire prevention.
4. Fire Safety Education - into schools, private homes, and into occupancies with greater than average fire potential or hazard to people, such as restaurants, hotels, hospitals, nursing homes, nightclubs, etc.
5. Deteriorated Building Hazards - coordinated with other municipal departments, fire departments can work to abate serious hazards to health and safety caused by deteriorated structures or abandoned buildings.
6. Regional Coordination - neighboring fire jurisdictions should have detailed plans for coping with emergencies exceeding the capability of a single fire fighting unit. Effectiveness is increased by area-wide communication and dispatching network.
7. Data Development - knowledge of how well a fire department is doing, and of how practices should change to improve performance, depends on adequate record keeping.
8. Community Relations - impression fire departments make on citizens affects how citizens view their government. Since fire stations are strategically located throughout the community, they can serve as referral or dispensing agencies for a wide range of municipal services.

taken from AMERICA BURNING

Evacuation Routes ⁵³

There are four main evacuation routes in the County. According to the Office of Emergency Services, they are: State Highways 65, 99, 190 and 198. (See map titled "Safety Critical Facilities" in Chapter IV).

Highway 99, a four to six lane divided highway is the major north-south freeway in the County. In the event of a disaster of major proportions requiring large-scale movement of people into or out of the County, this freeway would be the principle evacuation route.

Highway 65, which serves the east side valley communities such as Porterville, Lindsay, and Exeter, could serve as an evacuation route southward. The highway is mainly two lanes, just a small section is divided highway.

Highways 190 and 198 are the major east-west routes in the County. Both lead from Highway 99 and lead eastward into the mountains. Highway 198 is divided (much of freeway status) from 99 almost to the foothills. It is the major route into Kings Canyon National Park. Highway 190 passes through Porterville and then into the Tule river basin of the Sierras. Most of the valley portion of the highway is an improved two-lane highway or better.

There are several major arterials that could be utilized as evacuation routes depending upon the location and size of the disaster. Moreover, the valley portion of the County is served by a lattice-work of roads largely serving the agricultural needs of the County. Most of these could be placed into service, perhaps under police supervision, in time of a disaster.

The Tulare County Office of Emergency Services is continually reviewing and updating evacuation procedures for the County, in conjunction with state and local officials.⁵³ As new routes are delineated they should be reflected in the planning process. In conjunction with the Office of Emergency Services, the County departments and cities should work in concert to make certain that development activity does not conflict with the designated evacuation routes.

The County should strive to obtain an all weather route across the Sierras in order to serve areas of the eastern side of the County, particularly in the Kennedy Meadows area where lightning storms occur frequently.

A continuing working relationship between the County Departments and the Office of Emergency Services should be maintained. There is also a need for the Office of Emergency Services to work in conjunction with city departments and state and federal officials.

Flood Hazard

This element addresses the subject of flood hazard only briefly. Areas where information is lacking, relationship of flooding to other disaster conditions and sources of additional in-depth information of specific aspects of flood management are cited.

In times of fire hazard, flood potential and flood damage in general is significantly increased where natural vegetation has been burned off and no vegetative cover remains to replace the previously existing vegetation. During flood periods, houses, if flooded to a great enough depth, will often catch fire due to electrical short circuiting connections and disruption of utility systems. It is for these reasons that flood hazard is covered in this Safety Element.

Seismic Safety is a consideration when dealing with the possibilities for inundation of urban or urbanizing areas. Seismic conditions such as earthquakes, ground rupture, and other earth movement including subsidence and liquefaction problems may increase the possibilities for damage to drainage patterns, utility systems, and structural systems.³¹ The Seismic risk may also be increased if slopes are undercut as a result of flood action. Sedimentation potential increases dramatically during flood events, making the environment more susceptible to subsequent flood action, particularly in the lower foothill and valley areas of the County. The steeper mountain areas of Tulare County are granitic in character and do not pose the same degree of flood hazard potential as do the sedimentary formations in the lower foothill areas. Exceptions to this would be in smaller mountain valleys where some public structures such as bridges and roads may be located and often these facilities are flooded or undermined during heavy spring rain conditions. An exceptional amount of snow runoff creates the same condition. Consequently, the County is required to upgrade these facilities in the mountainous areas during these heavy runoff periods.

Types of Flooding⁵⁵

Various types of flooding are commonly referred to in flood plain management studies and these are discussed here briefly.

Sheet Flooding - refers to flood conditions where water has reached a lower elevation and has spread over a wide area usually on alluvial fans in the valley. The soil usually has become saturated and is not able to absorb the excess moisture. Consequently the water runs haphazardly on the landscape.

Another type of flooding which may induce sheet flooding or be coincidental with other types of flooding is River Overflow. Where rivers overflow banks and inundate structures, farm lands, and generally cause havoc with the man-made environment it is because too much water has entered the river systems at one time. This could be because of thunder showers which may be localized in nature or it could be as a result of heavy storage of snow in the mountains and rapid changes of temperature thus inducing rapid runoff of water.

Dam Inundation - is a term often used by flood control engineers and refers primarily to inundation or flooding of areas below dams as a result of dam breakage or overspill. Where it is not possible to release water from the dams rapidly enough, dam overflow is a possibility or dam inundation is possible if seismic conditions are such that an earthquake may rupture the dam. This happened in San Fernando in 1971 and caused considerable concern among residents of the San Fernando Valley who lived just below the dam.¹³ The Van Norman Reservoir ruptured as a result of earth triggered activity and a combination of soil conditions beneath the dam which caused the dam to fail. Fortunately the dam did not fail completely and engineers were able to turn water out of the dam fast enough to decrease the hazard.

Soil Erosion. Man-made hazards, particularly soil erosion, are often a result of poor planning and design. They may also be the result of natural conditions such as flooding. The shape of the earth is formed in large part on the surface by water related activity. In the case of mountain subdivision design it is particularly critical that adequate vegetation be provided for where erosion potential is greatest. Retaining walls, drainage systems and engineering facilities should be provided in subdivisions and developments in order to take care of excess water runoff. Excessively large

velocities can be generated by waters from such things as parking lots and road beds if not properly planned and designed and erosion results.²⁹

Another common type of flood hazard found in Tulare County is a result of bank failure along irrigation ditches. This can be caused by soil erosion, poor engineering practices, or (rarely) by earthquake. During the early 1950's the St. John's River broke out of its banks north of the City of Visalia causing a backup of water on the north side of the City. Many structures were inundated and much havoc occurred.⁵¹

Flood Information^{62,63}

For flood plain information and flood hazard data the Corps of Engineers studies of Sand and Cottonwood Creeks, Kaweah River, White River, Deer Creek and the Tule River (Springville area) are recommended for further information on flood hazard in Tulare County.

The County Flood Control Master Plan is also a viable document for use in analyzing structural conditions in the County and their relationship to existing and projected county flood control facilities and plans. The County Flood Control Master Plan recommends that flood plain zoning regulations be applied in order to control development in flood hazard areas within the County. In addition, the Bureau of Reclamation maintains flood prone area maps for use by the County.

Flood Risk

Risk from flood hazard is determined from a number of variables and is not consistent in that a once in 100 year event may occur, for example several years in a row. The variables included in the study of flood control and flood plain management that are critical in the understanding of flood characteristics include time, magnitude of events, probability of recurrence, natural and man-made physiographic characteristics of the region involved, and probable or potential weather conditions. Weather data is maintained by the United States Weather Department and goes back for a period of nearly 100 years.

It should be noted that flood characteristics of the Kings River have not been studied by the Corps of Engineers as extensively as the rivers mentioned above.

A GUIDE FOR PROTECTION FROM FLOOD HAZARD

A guide for determining the minimum desirable level of protection from flood hazard, using facilities or their contents as the indicator of potential damage.

<u>Minimum level of protection</u>	<u>Facilities or contents</u>
<p>CLASS 1: LOWEST WATER-ENTRY ELEVATION OF THE FACILITY IS NOT BELOW THE ELEVATION OF THE ADJUSTED 100-YEAR FLOOD.</p>	<ul style="list-style-type: none"> .Buildings containing valuable historical, legal, medical, financial, governmental, literary, or scientific documents or data. .Buildings containing research, commercial, or industrial instruments or machinery of high value or which contain materials whose escape or damage through flooding would endanger the public. .Hospitals and other buildings containing persons incapable of leaving during flooding and who may be endangered by failure of building utilities or services. .Buildings in themselves of national value. .Buildings of diplomatic importance. .Power installations needed during emergencies. .Warehouses, stock piles, tanks, and other facilities storing materials dangerous to the public if affected or released by flooding.
<p>CLASS 2: LOWEST WATER-ENTRY ELEVATION OF THE FACILITY IS NOT BELOW THE ELEVATION OF THE ADJUSTED 100-YEAR FLOOD.</p>	<ul style="list-style-type: none"> .Homes, apartment buildings, hotels, motels, and other residential buildings whose occupants may not have adequate warning or means of escape during floods. .Educational institutions, including dormitories. .Health institutions, including clinics, DDS and MD offices, and veterinary establishments. .Airfields or airports needing a high degree of protection. .Communications buildings, including telephone exchanges, telegraph offices, radio and TV stations. .Camp grounds for family groups or youth organizations. .Public service buildings such as police and fire stations. .Commercial and industrial buildings containing moderate cost or replaceable equipment or machinery. .Entertainment buildings such as stage or movie theaters, concert halls, and auditoriums. .Precision workers' shops such as those of engravers, jewelers, and machinists. .Public utility buildings or installations such as water or gas works. .Buildings in which animals are housed and from which they cannot escape during floods. .Warehouses, stock piles, tanks, and other facilities storing non-dangerous materials of public value.
<p>CLASS 3: LOWEST WATER-ENTRY ELEVATION OF THE FACILITY IS NOT BELOW THE ELEVATION OF THE ADJUSTED 50-YEAR FLOOD AND IS OUTSIDE THE DESIGNATED FLOODWAY.</p>	<ul style="list-style-type: none"> .Shops or stores retailing consumer goods of no more than moderate value. .Airfields or airports needing only a moderate level of protection. .Commercial and industrial buildings containing equipment or materials not dangerous to the public if flooded and not of high value. .Commercial service shops with salvageable equipment or goods. .Buildings or sheds for storage of easily moved machinery or vehicles. .High value agricultural or horticultural fields.
<p>CLASS 4: LOWEST WATER-ENTRY ELEVATION OF THE FACILITY IS NOT BELOW THE ELEVATION OF THE ADJUSTED 25-YEAR FLOOD AND IS OUTSIDE THE DESIGNATED FLOODWAY.</p>	<ul style="list-style-type: none"> .Open-air markets, amusement parks, or theaters. .Warehouses, stock piles, tanks and other facilities storing non-dangerous low-cost or recoverable equipment or materials.
<p>CLASS 5: LOWEST WATER-ENTRY ELEVATION OF THE FACILITY IS AT ANY ELEVATION ABOVE THAT WHERE FLOODING BEGINS IN THE FLOOD PLAIN.</p>	<ul style="list-style-type: none"> .Farm fields, pastures, and other open-air agriculturally used lands. .Parks, picnic grounds, and other open-air public spaces. .Vendors' stands in parks.

Source: Water Resources Council Proposed Flood Hazard Evaluation Guidelines for Federal Executive Agencies, September 1969

Instead, the floodway of the Kings River is controlled under authority of the State Reclamation Board. The river does contain a major control facility at Pine Flat Dam in Fresno County. Irrigation and recreation are secondary uses of the dam. In addition the lower portion of the Tule River and the upper Kern River have not been studied in depth. Precise information on flooding is not available for these two areas. Both areas, for safety purposes, should be studied and the level of risk associated with construction of facilities and homes should be detailed. Critical facilities such as hospitals and schools should be indicated and related to natural and man made environmental hazard potential.

For certain kinds of facilities only a minimum level of protection is necessary. For other kinds of facilities a much greater level of protection is required. The following listing taken from the Federal Water Resources Council Report titled "Proposed Flood Hazard Evaluation Guidelines for Federal Executive Agencies" (September, 1969) gives a good indication of the kinds of facilities that might be considered in a classification system which relates types of uses to various levels of flood risk. It should be noted that the classification system relies upon a 100-year, a 50-year, and a 25-year flood forecast to make a judgment as to the types of facilities that should or should not be allowed in a given area. A 100-year flood is a condition which theoretically would occur only once in every 100 years. Exactly when it will occur during that 100 year period cannot be precisely determined. The same condition could occur two years in a row, but the probability of that event happening is statistically rare. Only through statistical analysis of weather conditions and previous flooding conditions can estimates be given as to the magnitude 100-year or 50-year event for a given area.

Obviously, some judgment upon the part of the engineer is necessary in order to effectively use any kinds of classification standards such as suggested here. This classification system should be used in conjunction with land use decisions that are made on a day-to-day basis and could at least be a minimum basis for discussion of flood hazard in writing environmental impact reports, issuance of building permits, and determining where public facilities should be located.

Dam Failure Inundation Maps -- Pursuant to Section 8589.5 of the Government Code, Inundation Maps being prepared by the Department of Water Resources and the Office of Emergency Services are to be included in the Safety and Seismic Safety Elements of the General Plan of Tulare County.

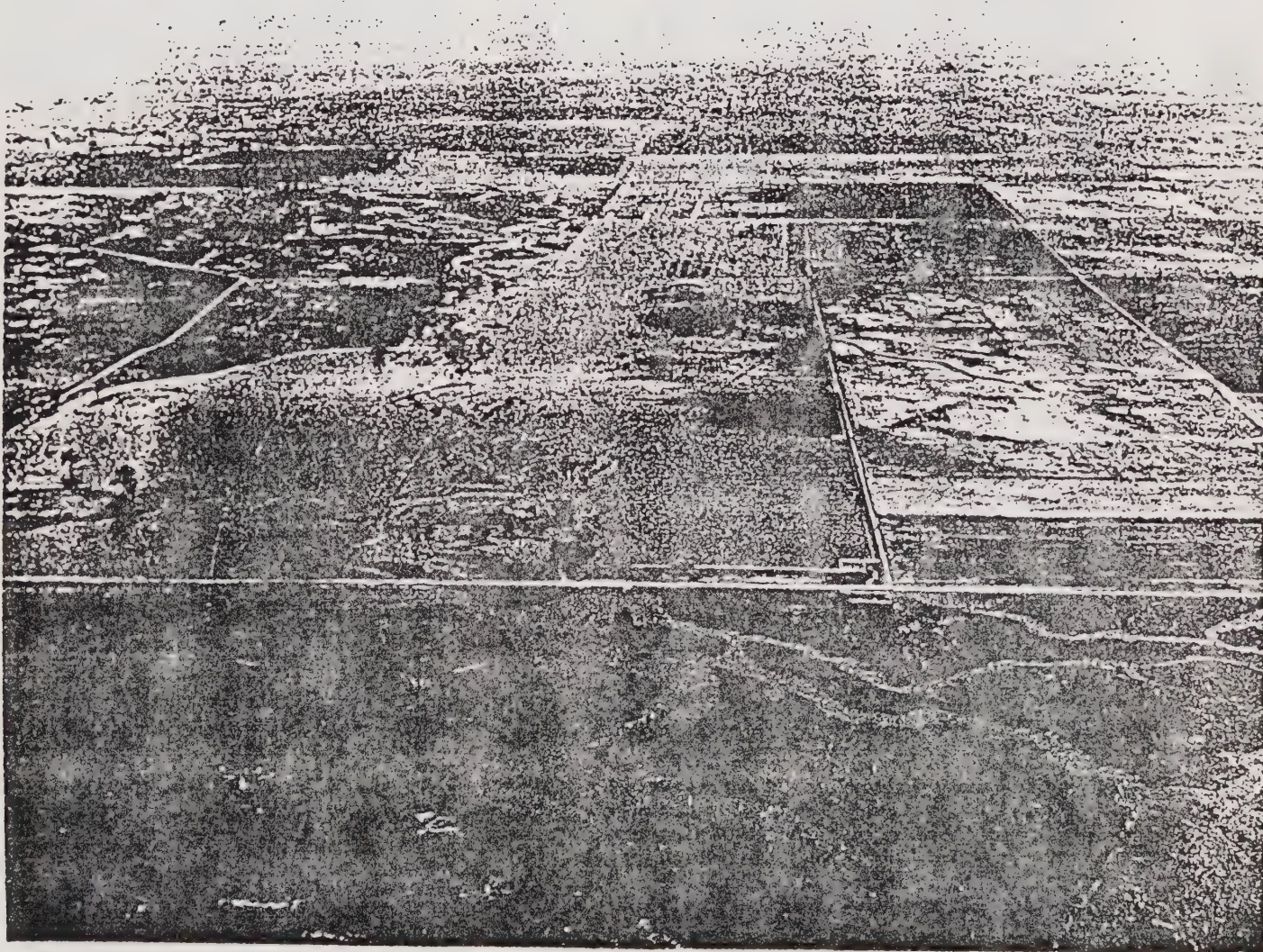
These maps were not available for publication with this report, but will be later included as a part of the plan element update procedure. Inundation maps should be available from the State Office of Emergency Services by early 1976. A listing of dams in Tulare County and the status of inundation maps related thereto, is included here for reference.

These inundation maps should be valuable in looking at evacuation routes and the use of evacuation routes during seismic disasters where potential for dam failure is greatest. In general it could be said that Tulare County is a relatively safe environment seismically, and the dams in the County have been inspected by the Office of Emergency Services and are considered to be well constructed and safe.

The State Office of Emergency Services has indicated that although the dam failure inundation maps are particularly valuable for describing evacuation routes, caution should be used when utilizing the maps. When available for the Tulare County area, these maps should be included in the General Plan of each governmental jurisdiction within the County.

It is recommended that Tulare County carry out the recommendations contained in the County Flood Control Master Plan.

It is recommended that the County determine the need for urban facilities in the urbanizing areas of the County where the potential for sheet flow is greatest and initiate a vigorous program to provide for curbs and gutters to prevent sheet flow hazard where possible. Storm drains should also be provided in areas that presently do not have them and are in need of them. These facilities should be provided primarily within the Urban Area Boundaries and more specifically within the Urban Improvement Areas as designated by the Board of Supervisors in the Urban Boundary Element of the General Plan.



This is an aerial view of a large portion of the valley floor undergoing flooding. The scene is looking down from the Sierra Nevadas as water channels its way on to the valley floor. Agricultural lands are inundated and silt and debris have clogged up the irrigation systems and canals that would normally carry off the water. The valley is very flat

and certain types of soil, particularly those high in clay content have a slow permeability rate. The need for curbs and gutters and storm drain systems in the urban areas is evident in many communities in Tulare County while the need for control of flood waters to protect high value of agricultural lands is evident in outlying areas.

APPENDIX A

STATE GUIDELINES FOR PREPARATION OF A SAFETY ELEMENT

SAFETY ELEMENT

(Taken from California Council on Intergovernmental Relations
General Plan Guidelines, September 1973)

1. AUTHORITY

Government Code Section 65302.1 requires a safety element of all city and county general plans, as follows:

A safety element for the protection of the community from fires and geologic hazards including features necessary for such protection as evacuation routes, peak load water supply requirements, minimum road widths, clearances around structures, and geologic hazard mapping in areas of known geologic hazard.

2. THE SCOPE AND NATURE OF THE SAFETY ELEMENT

The objective of this element is to introduce safety considerations in the planning process in order to reduce loss of life, injuries, damage to property, and economic and social dislocation resulting from fire and dangerous geologic occurrences.

A. General policy statement that:

- (1) Recognizes safety hazards
- (2) Identifies goals for reducing hazard
- (3) Specifies the level of acceptable risk
- (4) Specifies objectives to be attained in reducing safety hazards as related to existing and new structures.
- (5) Sets priorities for the abatement of safety hazards, recognizing the variable frequency and occurrence of hazardous events.

B. A map showing the location and extent of known geologic hazards.

C. Standards and general criteria for land use and circulation relating to:

- (1) Fire prevention and control
- (2) Geologic hazards

D. Consideration may be given to the crime prevention aspects of land use development such as planning for "defensible space."

3. METHODOLOGY

- A. Identification, mapping and evaluation of existing and potential hazards, both as to severity and frequency of occurrence. Analysis of hazardous land use relationships.

- B. With maximum citizen input "acceptable risk" should be determined. In making this determination, it should be kept in mind that any attempt to develop the appropriate planning response to potential hazard involves a judgment, either explicit or implicit, of how much risk is acceptable. There is no such thing as a perfectly hazard-free environment. Natural and man-made hazards of some kind and degree are always present. However, efforts can be productively undertaken to try to mitigate the consequences of known hazards.

In the context of the Safety Element, the problem of risk is one of public policy and the appropriate allocation of public resources to mitigate hazards. The central question is, "how safe is safe enough?" The planner's responsibility is to provide a framework in which a communitywide, as opposed to an individual, response to the question can be meaningful. The first of several essential steps is the recognition of the presence of a hazard. Much of the planning of the past has proceeded without enough knowledge of the natural forces at play in a given area.

Once a problem has been recognized, considerable effort is required to evaluate its likely severity, frequency, and the characteristics of the area involved. This step should take into account the benefit/cost ratio of reducing hazard, acknowledging the intangibles involved, and comparing it with that of other projects. The factors of voluntary and involuntary exposure to risk must be considered in reaching a decision.

- C. Define nature and magnitude of effort required to correct or mitigate hazards.
- D. Define general nature of regulations and programs needed to prevent or mitigate the effects of hazards in the developed and natural environments.
- E. Exchange information and advice with fire, police and public works departments, other agencies, and specialty personnel in the formulation of the element.

4. DEFINITION OF TERMS

- Acceptable Risk: The level of risk below which no specific action by local government is deemed to be necessary.
- Unacceptable Risk: Level of risk above which specific action by government is deemed to be necessary to protect life and property.
- Avoidable Risk: Risk not necessary to take because individual or public goals can be achieved at the same or less total "cost" by other means without taking the risk.

Defensible Space: Concept of urban space designed to inhibit crime by utilizing the proprietary concerns of residents. Key ingredients in designing defensible space include: improving the natural capability of residents to visually survey the public areas of their residential environment; enhancing spheres of territorial influence within which residents can easily adopt proprietary attitude; and enhancing safety through the strategic geographic location of intensively used community facilities.

5. RELATIONSHIPS OF THE SAFETY ELEMENT

A. To Other Elements:

- (1) The Safety Element contributes to developing land use standards and policies. These will relate type and intensity of use to the level of risk from fire and geologic hazard, to the effect of development upon that risk, and to the availability of services and facilities to combat them.

The Safety Element also contributes basic standards and requirements to the circulation and optional public utilities elements, and will have important implications for the open space and conservation elements.

- (2) Because of the strong relationship with the Seismic Safety Element, the local planning body may wish to prepare these two elements simultaneously or to combine the two elements into a single document.

B. To Other Factors:

- (1) Social: The element is directed at reducing social costs due to injury, loss of life, or public or private dislocations increasing the sense of community security and well-being.
- (2) Economic: The element should be directed at reducing costs of direct property loss and economic dislocation.
- (3) Environmental Impact: The Safety Element provides the policy directives for reducing adverse impacts on both the built and natural environments of major safety hazards.

C. To Other Agencies:

- (1) The preparation of the Safety Element would also be facilitated by identifying, and securing the cooperation of major Federal, state, regional and private owners of land in a largely natural state, which affects the potential fire hazard. Such agencies would include, for example, the national and state park services.
- (2) Local planning bodies are encouraged to enter into joint planning and the execution of mutual assistance pacts related to safety hazards materially affecting more than one planning jurisdiction.

6. IMPLEMENTATION

- A. Concurrent or subsequent revision of other general plan elements to incorporate safety policies and criteria.
- B. Addition of capital improvements as may be necessary for the mitigation and control of safety hazards to the capital improvement program.
- C. Review and possible amendment of zoning, subdivision and site development regulations to incorporate safety provisions.
- D. Formulate building and fire safety inspection programs of buildings and premises to identify fire and other safety hazards.
- E. Provide input to contingency plans for major disaster or emergencies.
- F. Provide for ongoing review of major public and private development proposals by fire and police departments to insure compatibility with safety objectives.

APPENDIX B
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BIBLIOGRAPHY

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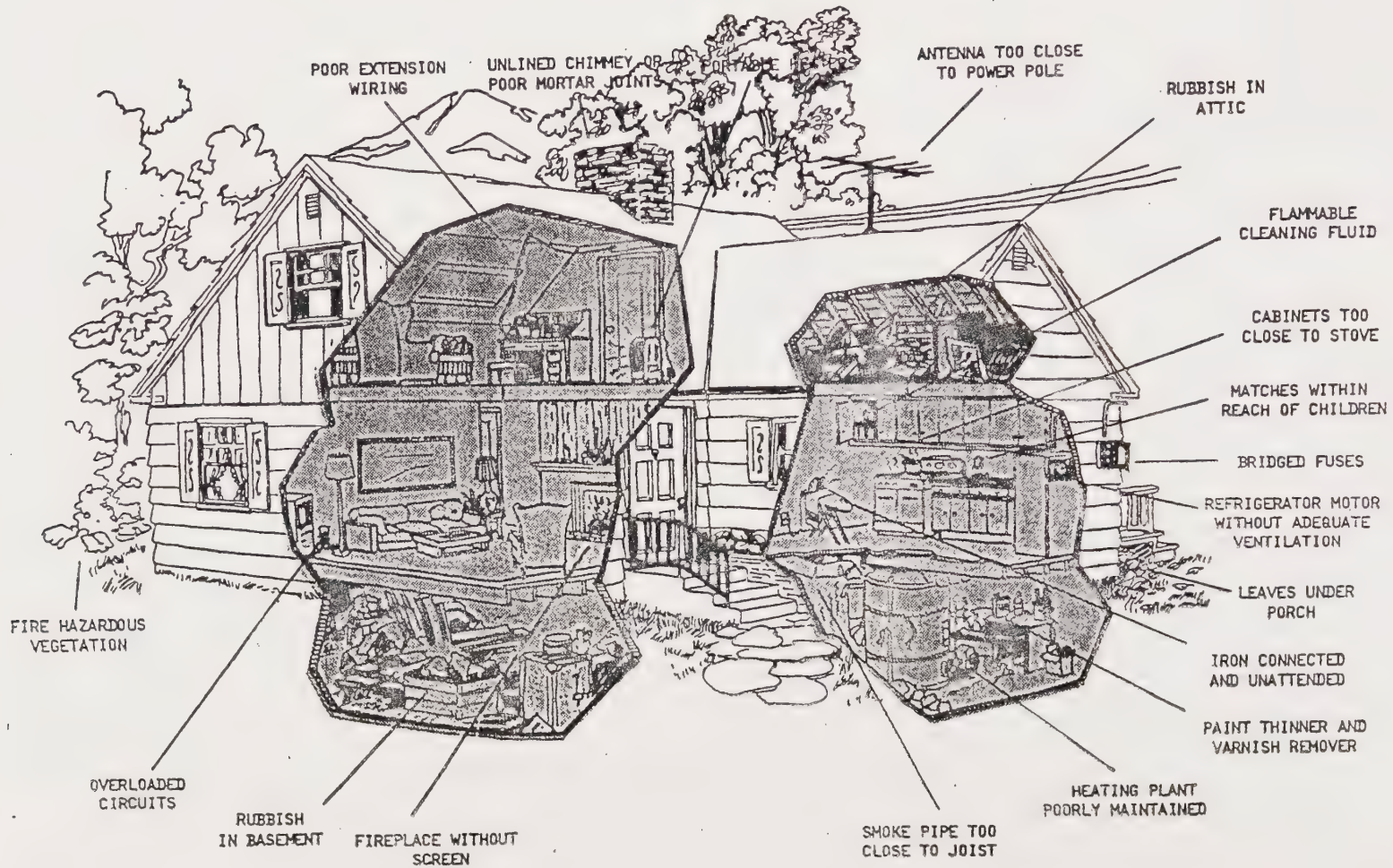
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APPENDIX C
HOW TO PREVENT FIRES IN AND AROUND THE HOME

Fire Safety Begins With Prevention



APPENDIX D
ENVIRONMENTAL IMPACT REPORT

E.R.C. 74-401/EIR
X-Ref. Tul. Co. Plan. Dept.
Safety Element of the Tulare
County General Plan
January, 1975
X-Ref. Seismic Safety
Element EIR

ENVIRONMENTAL IMPACT REPORT

DESCRIPTION OF PROJECT:

The Safety Element for all city and county general plans in the State of California is mandated by the State Legislature because of the real and difficult to predict peril of fire hazard, earth movement, flooding, nuclear hazards and related structural and environmental potential for disaster and damage to the economic and social relationships between people, resources and facilities for serving people. The State of California has mandated counties and cities to prepare a Safety Element of their general plans in order to mitigate or dilute the attendant risk associated with potential public hazards as mentioned above.

Section 65302.1 of the Government Code and the Council on Intergovernmental Relations, Guidelines of September 1973, give scope and direction for preparation of an Element. The Tulare County Safety Element recognizes these Guidelines as important and has enlarged upon them to meet the goals and objectives as defined in the Element for the cities within the County and the County unincorporated area. The Safety Element can be adopted as is or with modifications as desired by local general purpose governments or the Tulare County Association of Governments as the Regional Planning Agency. Only these agencies have the power and authority to adopt the Safety Element.

DESCRIPTION OF EXISTING ENVIRONMENT:

Tulare County lies in the southern half and on the east side of the San Joaquin Valley, the great central valley of California which is bounded on three sides by mountains - the Coast Range to the west, the Sierra Nevadas to the east and south. The County itself covers approximately 4,863 square miles and includes 3,112,320 acres. About one-fourth of the area is suitable for cultivation primarily, the western side of the County. The Federal government owns 1,545,638 acres or 49.6 percent of the County, of which all but about 60,000 acres is public forest and recreation land. The 60,000 acres includes the Tule River Indian Reservation (54,000 acres) and various canals and reservoirs. Sequoia and Kings Canyon National Parks comprise over 845,000 acres of Federally owned land. The State of California owns 26,436 acres (.8%) of which 5,000 acres is in public forest. This amount of State and Federal ownership means that only slightly under 50% of Tulare County land is directly under the control of local government.

Tulare County has eight incorporated cities. Their urban area projected populations in 1973 were:

Visalia	47,600	Lindsay	8,900
Porterville	27,450	Exeter	5,800
Tulare	25,500	Farmersville	4,400
Dinuba	10,000	Woodlake	4,000

Safety Element EIR

Approximately 50 rural service centers, generally occurring at five mile intervals along arterials are found throughout the valley. In 1970, about 67 percent of the County residents were in urban densities; by 1990 a figure of 86 percent is anticipated.

Transportation is mainly by roads. State Highway 99 and Interstate 5 are the major transportation arteries and carry traffic in a north-south direction through the valley. The rugged heights of the Sierra Nevadas preclude east-west highways in this area and access to this portion of the Sierra Nevadas is limited. The area also has Amtrak Service, Southern Pacific and the Santa Fe Railroads. Visalia has regularly scheduled stops of commercial airlines. There are also several air fields serving private aircraft.

The Valley lands are nearly level with very gently to rolling slopes along the valley margins. Elevations range from sea-level to about 500 feet. The foothill area is characterized by rolling to hilly relief and dissected by numerous streams flowing gently into the valley. The foothills begin as terraces along the east edge of the valley floor, merge into gentle slopes, then become steep. "Foothill" elevations range from about 500 to 3,000 feet. The mountain area, with elevations from 3,000 to 14,495 feet (Mt. Whitney is the highest point in the United States outside of Alaska) is characterized by hilly to steep mountains, with valleys of 3,000 to 7,000 feet in height.

The County contains numerous highways and roads that have been constructed with the use of Federal aid funds and several major north-south and east-west Federal highways (or freeways as they are commonly called in California) pass through the County, these being U.S. Highway 65, passing north from U.S. 99 in Kern County to Porterville and then to Lindsay; U.S. Highway 99 passing from the south boundary of the County to the north boundary; Highway 198 crossing in an east-west direction to the Sequoia National Forest and across the valley floor; U.S. Highway 63 stemming off of U.S. Route 99 in Tulare and going into the City of Visalia is one of the largest traffic carriers in the County. The large network of roads that cover the valley floor are primarily for the purpose of moving agricultural goods and services and providing intra-community contact within the County and within the State. Some of the largest highways carry 5,000 or more automobiles and include Avenues 416, 384, 304, 280, 248, 240, 232, 224, 216, 56 and 48; (it should be noted that Avenues run in an east-west direction while roads run in a north-south direction) and Roads 8, 56, 80 and portions of Road 88 and 96 near Tulare, side roads adjacent to U.S. Route 99, 104, 120, small pieces of 128 and other arterials in and around the City of Visalia, 152, 166, 192, 196, 208, 216, 224 near Lindsay, plus a number of small roadway sections in and around the City of Porterville that are local arteries, and a sizable portion of Road 256 in and near Porterville. None of the mountain routes that enter the forest and mountain areas of the County carry over 5,000 vehicles per day on the average as calculated on a yearly basis, with the exception of such routes as Highways 198 and 190 that go to major tourist attractions and centers. These routes may on any given day, carry very large volumes of traffic. The Safety Element identifies those routes that are deemed critical for emergency and disaster purposes during seasonal periods. Tourist activities are increasing all through the mountain areas both in the winter as well as the summer in the County of Tulare.

Safety Element EIR

The County contains lands subject to slope instability and high erosion potential with lesser amounts subject to soil subsidence and liquefaction. The valley floor is underlain with thick alluvium deposits while the mountainous areas are underlain by large granite or other masses of varying texture, thickness and stability. The central valley is a deep trough. Tulare County forms part of this trough filled with sediment deposited by rivers from nearby mountains when the valley was being formed. The County contains nearly all classes of soil (from I to VIII, except V, as identified by U.S.S.C.S.) as the result of erosion activity as well as natural processes of nature that have occurred over milleniums of time.

The primary industry in Tulare County is agriculture. The County rates third in the nation in terms of dollar income earned from high income producing lands especially to the east and near the foothills of the mountain ranges where citrus, avocados and stone fruits are grown. Other examples of major crops grown in the County would include grapes, small grains, cotton, pasture, fruits, nuts, beets, and dry beans.

Protection from flooding is important for valley soils because they are usually poorly drained and the facilities necessary for carrying on agricultural activity are extremely sensitive to flooding activity. In addition, the communities that have sprung up on the valley floor in the past were often situated within the wake of potential flood plain areas. Consequently, a number of large and small dams are located within the mountainous and foothill areas of the County for storage of mountain storm water runoff, so that it can be used in the summer months for agricultural use. The water is also used for recreation, drinking, industrial activity, and generation of power. Portions of the valley floor having alkali and salt problems mostly to the southeast of the County, and in Kings County to the west, must undergo reclamation in order to be cultivated and this often requires large amounts of water to dilute the salts.

SOILS:

Alluvial Fans and Floodplain Soils:

Little or no conservation efforts are required for soils of these usually deep and well-drained, non-saline and non-alkaline soils. Erosion is no problem.

Low Terrace Soils:

When these are saline-alkali with hardpan, reclamation becomes difficult. Characterized by low fertility and moisture capacity.

Terrace Soils:

Shallow with low fertility and moisture capacity. Erosion is a problem. Well-drained, sandy, wind-modified soils. These are low in fertility and moisture capacity and have wind erosion problems.

Foothill Soils:

Principal crops are deciduous fruits and grains. These soils break into two basic types: shallow, well-drained, slightly acid, stoney or rocky medium textured upland or moderately deep to deep moderate coarse textured, well-drained, slightly acid upland.

Safety Element EIR

The shallow soils have conservation problems due to lack of depth and concentration of rocky materials, but erosion is only slight if enough vegetation remains to hold the soil in place. The moderately deep to deep soils are low in fertility and tend to be strongly erosive in character.

Sierra Nevada Soils:

The uses are usually recreation or lumbering with some grazing. The land is managed by the U.S. Forest Service, National Park Service and Bureau of Land Management. There are four general types of soil mantle consisting of upland soils of high to medium elevation, shallow to moderately deep, coarse and moderately coarse textured; plus alluvial soils that are found in mountain valleys, often poorly drained, moderately coarse to moderately fine textured. The soils are found on hilly to mountainous terrain; erosion results when soils are disturbed. Shallower soils found in the mountainous areas are handicapped by their depth and low water holding capacity. The mountain valley soils often have drainage problems, possibly gullying, and low potential for being cultivated.

The major man-made bodies of water are Lake Kaweah and Lake Success. Both are situated at the edge of foothills behind earth and rock filled dams with capacities (not counting flood surcharge spilling) of 8,000 to 150,000 acre feet at Kaweah and 9,000 to 82,000 acre feet at Success. The Friant-Kern Canal has a conveying capacity average of 5,000 cubic feet per second at the head which is located at Friant.

BIOTA:

Endangered Species:

Blunt-Nosed Leopard Lizard
California Condor
Southern Bald Eagle

San Joaquin Kit Fox
American Peregrine Falcon

Rare Species:

Giant Garter Snake
Southern Wolverine
California Bighorn Sheep

Spotted Bat*
Prairie Falcon*
Yellow-Billed Cuckoo*

*(According to U.S. Dept. of Interior - not identified in preliminary Biological Resources Element of Tulare County)

Special Concern:

California Slender Salamander
Golden Trout
Great Blue Heron

Ferruginous Hawk
Osprey
Tiger Salamander

There are many other species including coyote, hawks, snakes, rabbits, cats, rodents, etc.

Safety Element EIR

BACKGROUND OF THE SAFETY ELEMENT:

The Safety Element was begun in the fiscal year 1973-74 and a major portion of the work was completed during the summer of 1974. The project was carried out in conjunction with the Tulare County Fire Warden, The Tulare County Office of Emergency Services, a representative from the City of Porterville who represented the cities within the County on the technical committee, and a representative of the Tulare County Planning Department and other interested persons who participated from time to time. The Element was prepared for adoption by the Tulare County Association of Governments and including the cities within the County. Portions of the work were carried out under the auspices of CPA 1020.19, a grant administered by the Tulare County Association of Governments through the Council on Intergovernmental Relations. Since Federal funds were partially utilized to complete the Element, and since the County has an active public participation program underway, it was decided early in the process to utilize the Agricultural Advisory Committee and the Environmental Quality Committee of Tulare County to aid in the establishment of goals and objectives for the Element. A number of public meetings were held with these groups and with the technical committee. In addition, meetings were held with the Chambers of Commerce, schools and city officials as requested.

All meetings of the committees were held at places and times convenient to the public and were generally well attended. Periodic reports were made to the Tulare County Association of Governments on progress and preparation of the Element.

The technical nature of the project was such that it was necessary to utilize data and information developed by other agencies in the preparation of the Element; for example, the California State Division of Forestry has prepared extensive studies of the Fire Danger Rating Areas indicated in the Element. The Office of Emergency Services prepared information on evacuation routes and on nuclear attack procedures. The Atomic Energy Commission has prepared a variety of documents on nuclear facilities and their impact on the environment and such groups as the Sierra Club and other citizen based organizations have also prepared such documents. These were reviewed in preparing the Element. The County is fortunate in having a policy base that is varied and extensive and where this policy base could be utilized in preparing this Element it was done.

Included in the policy base were such Elements as the Environmental Resources Management Element, the Water and Liquid Waste Management Element, the Housing Element, and the Land Use Element of the General Plan for Tulare County. Assistance was given to the staff from the Insurance Services Office in San Francisco and the County Executive Officer of Tulare County.

In addition, the Seismic Safety Element of the General Plan was prepared in conjunction with adjacent counties and cities and it is referenced herein. An extensive EIR was prepared for the Seismic Safety Element and circulated throughout the State of California prior to its being submitted for adoption to the Board of Supervisors.

Safety Element EIR

RELATIONSHIP TO GENERAL PLAN:

The Safety Element is a State mandated Element of the General Plan for every county and city. The attached Element meets all requirements of the adopted State guidelines promulgated by the California Council on Intergovernmental Relations. It protects from and mitigates the risk involved with environmental hazards related in particular to fire, flood, nuclear material and facilities and seismicity. It is closely related to the Seismic Safety Element.

THE ENVIRONMENTAL IMPACT OF THE PROPOSED ACTION:

The impact of adoption of a Safety Element would be primarily beneficial on balance to people, the environment and structures including facilities and materials that people use to carry on their daily life's work and activity. The Element is designed to assist in planning and guiding development activity to lessen the possibility of safety hazards to lives, environment and man's works and activities. In this respect, the Element is designed for maintenance and enhancement of the long-term productivity of the County. Some physical changes can be anticipated in the environment if the plan were carried out in its entirety. Some possible shifts in population location could be anticipated where safety considerations were paramount in the land use planning process. Some areas within the mountain and foothill zones of the County have greater fire hazard danger and these are specifically detailed in the Element.

The Safety Element of the General Plan contains policies that, if implemented, could have adverse environmental impacts and they are listed as follows with specific reference to the policies contained in the Element that would, if carried out, have impact upon the environment and the County as a whole.

There is the potential for removal of housing stock, that, even if unsafe, may be the only available housing for certain income groups. The cost of fire suppression and prevention equipment must come from the tax base of the County, at least in part, and this would be an economic concern that would be adverse to some people within the community. There is also the possibility that groundwater would be reduced where provision of additional water for fire safety reduces the availability of water. This would be rare however, since most water that is used for fire fighting and suppression is on a periodic basis only.

The no-burning ordinance that the County of Tulare presently has in force is often not adequate for protection of urbanizing areas on the fringe of the cities within the County. If adequate enforcement is not provided in urbanizing areas, then they are subjected to the increased risk of fire hazard. In addition, the weed abatement programs that are carried out in conjunction with fire safety, often discourage wildlife and their populations by reducing habitat and feeding grounds. The addition of storm and flood facilities would create complex sets of environmental problems including soil erosion and disturbance of wildlife, disturbance of people, and the disturbance of complex ecosystems.

Fire retardant materials may on occasion be displeasing from an aesthetic point of view. For example, metal buildings might be more useful for fire safety than wood or painted structures. The inspection and policing of structures particularly where chemical and fuel storage facilities are maintained could disrupt or disturb business activity from time to time which would impact the economy slightly. This might also disturb some citizens.

Safety Element EIR

Mobile fire protection units could cause additional air pollution. Training for fire fighting and fire safety, where chemical, fuel, and structural fire testing is being carried out could also add to air pollution, especially particulate matter.

Even though nuclear reactors and materials contain safeguards, there is no historical reference to indicate to what degree these facilities might be harmful to the environment. The Element suggests that they be sited properly and that the public be properly informed about procedures and safety arrangements. This may be inadequate since there is so little historic information. The impact on the environment would essentially come when these facilities were not properly maintained or where safety standards were not enforced.

Grading and construction for fire safety, roads and access would create economic and environmental costs from erosion, siltation of storm drains, destruction of wildlife habitat or feeding areas, additional noise in the environment and air pollution.

The positive or negative effect of fire in the mountain regions is a subject of intense debate. Fire is considered by many scientists to be a natural phenomena and the retardation of natural burning of wildland areas is considered by some to be only a prolonging of disaster. If this is the case, then the hazards associated with conflagrations of large size could be costly to human life, man-made works and improvements and the natural environment.

Evacuation routes may turn out to be unsatisfactory since they are in conflict with average annual daily traffic counts as shown by the Tulare County Public Works Department and the California Division of Highways in their annual surveys. These routes although satisfactory for carrying large volumes of traffic may be less desirable in a disaster situation due to conflict with existing high volumes of traffic.

Controlled burning practices can reduce fire hazard but can also increase potential for mud slides, erosion and runoff, thus resulting in siltation of dams and reservoirs and destruction of public roads and facilities.

Since the Safety Element is primarily related to the concept of reducing risk to people then it could be considered an environmental impact when the infringement of property rights and resulting social disruption creates police problems and public outcry of residents are requested to comply with standards for safety or conversely when individuals do not comply with safety precautions and endanger the community.

ANY ADVERSE ENVIRONMENTAL EFFECTS WHICH CANNOT BE AVOIDED IF THE PROPOSAL IS IMPLEMENTED:

It is evident that the removal of housing stock and the disruption of natural areas in order to create fire breaks are environmental effects which cannot be avoided if the proposal is implemented. There are inevitably some environmental effects that cannot be avoided where topography is disturbed and it is necessary to construct man-made works. Within the context of a general plan element it is not possible to deal with all of the individual actions that would result from the adoption of a Safety Element and the carrying out of the policies contained therein except in a general way.

Safety Element EIR

Although the County is a relatively safe place to live, proposals for nuclear facilities and large industrial facilities do offer the potential for adverse environmental effects when such facilities cannot be adequately designed with sufficient safety planning. When construction is allowed in airport zones, then there is the danger of social disruption and the loss of human lives.

In general, it can be said that the environment will always have hazards associated with it. It is impossible to assume that man can completely remove all of the adverse environmental effects of his activities if he is to have a safe environment. In this respect, any Element of a general plan with its long range implications is to some degree in conflict with environmental protection if one assumes that protection means a static state of the environment being continued indefinitely. (The disruption of wildlife habitat could be considered irreversible and the dislocation of people resulting from attempts to provide a safe environment and remove unsafe structures is obviously an unpopular hazard.) Extensive financial costs to renovate buildings and improve the environment could be considered as adverse environmental effects which cannot be avoided. Also the expenditure of energy necessary to construct safety features and fuel breaks in the mountainous regions cannot be avoided. The commitment of tax funds is also an irreversible commitment and the potential for disrupting or destroying archaeological artifacts while attempting to mitigate the potential impact of fire, seismic hazard and flood hazard are irreversible, especially where mistakes are made without construction personnel being able to identify archaeological artifacts.

MITIGATION MEASURES PROPOSED TO MINIMIZE THE IMPACT:

The elimination of some substandard housing stock may be in part mitigated through the recommendations contained within the Housing Element of the General Plan for Tulare County and the potential for funding under the Housing and Community Development Act of 1974. There is also the potential for upgrading unsafe structures in general, where safety can be brought about through the installation of new wiring and electrical systems to offset the piecemeal hazardous electrical systems that have been installed in structures over the years. In addition, adoption of the Uniform Fire Code, as recommended in the Element, would give authority to safety officials to assist in evaluation of hazardous structures.

Topography, where it is disrupted or destroyed, can be mitigated to some degree by the use of annual grasses, or the planting of fire retardant plant materials that have a low heat yield and do not add to the potential for conflagration. Fire breaks can still be maintained but erosion can be reduced by this method.

The cost of fire suppression and prevention equipment that must come from the tax base of the County may eventually be offset to some degree by Federal support for implementation of plans and programs. In many cases, the cost of fire prevention equipment as outlined in the Element can be born by individual homeowners or ranchers, particularly those in outlying areas needing better protection, since the cost of the equipment is not high. In addition, technology may bring about other kinds of warning devices and mitigation measures in the near future that can be used in outlying areas of the County where the danger is greatest to residents of homes and ranches that are not near fire stations, (five minutes or five miles).

Safety Element EIR

The no-burning laws that are presently in force throughout the County have provided some measure of safety particularly in urbanizing areas. Further evaluation of this program needs to be undertaken, not only to determine the weak points of the program but to suggest more adequate measures for dealing with the problem of air pollution and fire hazard, particularly in urbanized areas. For agricultural purposes, burning is necessary in many cases and may have high value in terms of nutrients returned to the soil in a quicker fashion than if plowed under. In addition, agricultural burning, although adding to the amount of particulate matter in the air, does burn efficiently compared to internal combustion. The cost of burning, in terms of economics, is less than the cost of plowing the material under or destroying it in some other manner, and kills harmful plant viruses which are not destroyed by plowing under. Though weed abatement discourages wildlife and bird populations and reduces habitat, it also has the potential for saving of human lives which are more significant in value. The mitigation measures that could be used to curtail the need for weed abatement are essentially contained within the Urban Area Boundaries Element of the Tulare County General Plan. That element suggests that urbanized uses be placed in compact areas so that weed abatement and other problems of this kind can be more adequately attacked in a concentrated manner, thereby reducing the cost of local government services.

Where groundwater supplies or surface water supplies are reduced as a result of fighting fires, the benefits obtained in most cases would probably outweigh the costs in terms of the environment. Mitigation measures would include providing additional water to ponds via pumping equipment that the fire department maintains for fire fighting.

Where provision of storm and flood facilities create environmental problems such as soil erosion, disturbance of wildlife and disturbance of people as well as complex ecosystems, mitigation measures would have to include such things as the seeding of the looser soils and seeding of potential wildlife areas along channels and other man-made works. Disturbance of people would in many cases be only temporary and mitigation measures would be included in such elements as the Noise Element and nuisance ordinances that the County maintains. Utilization of quieter equipment and the wetting down of project sites during construction to reduce dust are mitigation measures that can be used.

Where aesthetics are concerned, metal buildings and other fire safe structures can be landscaped or screened from view. The inspection and policing of structures where chemical and fuel storage facilities are maintained can be mitigated somewhat by the enforcing agents giving property owners adequate notice as to when they are to arrive and making their schedules convenient for the consumers of the service that they have to offer. Disturbance of citizens has much to do with the fire department and other safety agencies providing adequate information about their activities and the purposes thereof. In addition, some reasonable period of time should be allowed for compliance with standards proposed.

Safety Element EIR

The small amount of air pollution that would be caused by mobile fire protection units is offset by the benefits gained from reduced hazard in the environment and to people, as well as the reduced costs that could potentially show up on insurance costs to each resident in the County over a period of time. Structural fire testing can be done on days when air pollution is already at reduced levels and there are winds to carry the particulate matter out of the valley floor. Mitigation of the problem will require close coordination with the County Health Officer who acts as the Air Pollution Control District in Tulare County.

There are no mitigation measures offered to reduce the hazard associated with potential for nuclear disaster once an event has occurred. The Elements suggest that siting procedures include putting nuclear facilities deep enough in the ground so that if there is seismic disturbance or threat of hazard it can be contained. This is a matter of design on specific projects. The Element does not include all of the characteristics that would be necessary for mitigation of potential hazard due to nuclear facility breakdown or disruption. The safety of these facilities should be enforced with adequate fencing and controls so that they do not become objects of destruction for vandals or politically motivated groups.

Grading and construction for fire safety roads and access does create economic costs; however, the economic benefits gained often outweigh those costs and mitigation measures such as planting certain kinds of grasses have previously been mentioned. The amount of disturbance that would be created in wildlife habitats and feeding areas cannot be ascertained at this time. Mitigation should occur where known substantial amounts of wildlife and bird life do exist. Noise created in the environment as a result of grading and construction activity in mountain areas can be avoided by utilization of quieter equipment.

The positive and negative effects of wildland fires as pointed out before is a subject of intense debate. Fire officials can be trained to coordinate their activities with other agencies responsible for wildlife and biota. In addition, setting priorities for controlled burning would assist in the maintenance of environmental management policies throughout the County. The positive impact of controlled burning is that human life and man-made works and improvements as well as the natural environment would be subjected to less hazard in certain areas due to decreasing the fire load potential.

Evacuation routes as pointed out in the previous section could conflict with the larger amounts of traffic being carried on the same highways. Mitigation measures might include the selection of alternate routes and directing of traffic onto those alternate routes during time of disaster or conflict. The evacuation routes need to be further substantiated with time and volume studies to support their designation as emergency evacuation or routes of principal assistance.

Safety Element EIR

The controlled burning practices proposed above will produce erosion and runoff and result in siltation of dams and reservoirs. In addition, controlled burning practices can be destructive to public roads and facilities. The mitigation measures proposed would be to carry on controlled burning practices at times of the year when runoff was less likely to occur due to thunderstorms and where erosion could be controlled.

The project in itself proposes mitigation of potential impacts on the environment and on man and his activities or works. Information contained within the Element and the possible applications are such that human activities would be more likely to be distributed within the County in such a fashion that the safety hazards to human life and environment would be lessened.

ALTERNATIVES TO THE PROPOSED ACTION:

1. No project. This would allow continued, uneducated exposure of man and his works to safety hazards and the continued destruction of the environment due to fire, earthquake, flood and man-made disasters.
2. Delay the project. This would have effects similar to no project until a decision was made to allow the project to either be completed in its present form or altered in some way. State law does not allow this to happen however.
3. Allow the project. This offers an opportunity for planning, programming, managing and budgeting in order to channel man's activities in such a way that potential safety hazards can be mitigated and planned for in a more rational manner. In addition, the Element provides a general overview of the safety problems that face the County and the economic costs associated with mitigating hazards.

THE RELATIONSHIP BETWEEN LOCAL SHORT-TERM USES OF MAN'S ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY:

Cumulative effects of vegetation, buildup, water runoff, erosion, and lack of consideration for seismic safety, would tend to bring about destruction of the long-term productivity of the Tulare County area, in favor of local short-term negligence of the environment. The County has adopted numerous policies to prevent this from happening and the Safety Element is but one of these policies. The Element offers long and short-term benefits if applied in a comprehensive and adequate manner. The study does not pose long-term risk to health or safety, but on the contrary, will serve to mitigate such risk if opportunity is given to safety and emergency service personnel to develop and implement policy. There would be little narrowing of the beneficial uses of the environment since land uses could be better protected from natural and man-made hazards.

Safety Element EIR

ANY IRREVERSIBLE ENVIRONMENTAL CHANGES WHICH WOULD BE INVOLVED IN THE PROPOSED ACTION SHOULD IT BE IMPLEMENTED:

Some shifting of population (consequent changes in rural patterns) has been noted, however, the major impacts discussed in the Element are, for all practical purposes, positive on balance. Those environmental changes that would be brought about by better planning for safety hazards would tend to mitigate the possibility of environmental damage.

One danger lies in the fact that some activities or industries may be invited into the County because of the relatively safe environment that is offered. This being the case, then there is the prospect of people and hazardous activities being introduced into the County which might not have otherwise been introduced. It is not possible to estimate the degree to which this would occur, however. Clearance of vegetation, disruption of animal habitat and grading practices, plus financial costs of rebuilding or renovating structures are irreversible actions and commitment of funds that cannot be avoided if the project is carried out.

GROWTH INDUCING IMPACT OF THE PROPOSED ACTION:

This Element has no discernible impact upon growth. This is primarily a consideration of the land use and circulation plans of the County.

ORGANIZATIONS AND PERSONS CONSULTED:

Eight incorporated cities
Tulare County Association of Governments
Tulare County Public Works Department
Tulare County Health Department
Tulare County Fire Warden
State Office of Planning and Research
Tulare County Office of Emergency Services
Sequoia and Kings Canyon National Park Staff
U.S. Bureau of Land Management
Sequoia National Forest
County Executive Officer of Tulare County
Tulare County Department of Education

WATER QUALITY ASPECT:

Certification is not required for review of General Plan Elements by Water Quality Control Board.

COORDINATION:

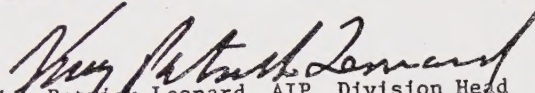
This Environmental Impact Report was prepared by the Tulare County Planning Department in accordance with the directives of the Tulare County Board of Supervisors.

FINAL STATEMENT:

Further statements from public and private agencies that have been and/or will be notified are to be attached upon the completion of this report. These statements, verbatim, will reflect the opinions of persons and agencies contacted in reference to this document. Responses to significant environmental points raised in the review and consultation process will be addressed in the form of an attachment to the Final Environmental Impact Report.

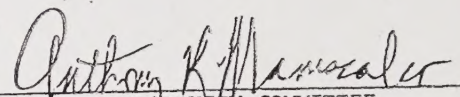
Respectfully submitted,

TULARE COUNTY PLANNING DEPARTMENT
Robert L. Wall, Planning Director


King Patrick Leonard, AIP, Division Head
Environmental Section

KPL:jm

APPROVED BY


ENVIRONMENTAL REVIEW COMMITTEE
11/27/75
DATE
30 days
REVIEW PERIOD



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1975-1976

1975-1976

1975-1976

The following is a list of the names of the persons who have been elected to the office of President of the University of California for the year 1975-1976. The names are listed in alphabetical order of their last names. The names of the persons who have been elected to the office of President of the University of California for the year 1975-1976 are: [illegible text]

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[illegible text]

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